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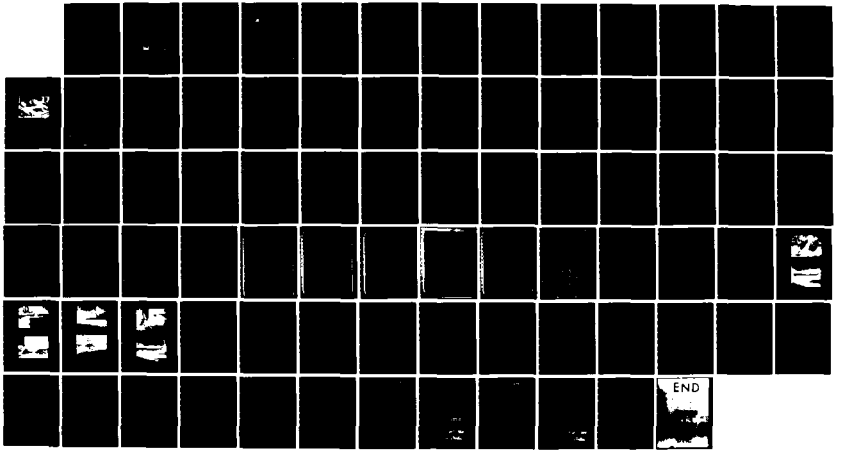

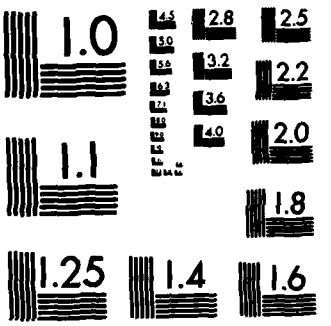

CONNECTICUT RIVER BASIN
SUFFIELD, CONNECTICUT

SCHWARTZ POND DAM
CT 00280

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

APRIL 1981

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Connecticut River Basin
Suffield, Connecticut

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The Schwartz Pond Dam is a masonry and concrete structure approximately 128 ft. long, with a top width of 2 ft. and a maximum height of 16 ft. Based on visual inspection, the Schwartz Pond Dam is judged to be in fair condition. As per the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the Schwartz Pond Dam is classified as 'small' in size with 'low' hazard potential. A test flood equal to 100-year frequency event was selected in accordance with the Corps of Engineers.

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SCHWARTZ POND DAM

CT 00280

CONNECTICUT RIVER BASIN

SUFFIELD, CONNECTICUT

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM
PHASE I INSPECTION REPORT

IDENTIFICATION NO: CT-00280

NAME OF DAM: Schwartz Pond Dam

TOWN: Suffield

COUNTY AND STATE: Hartford County, Connecticut

STREAM: Stony Brook, a tributary of Connecticut River

DATE OF INSPECTION: December 17, 1980

BRIEF ASSESSMENT

The Schwartz Pond Dam is a masonry and concrete structure approximately 128 ft. long, with a top width of 2 ft. and a maximum height of 16 ft.

There is a 3'x4' regulating outlet controlled by a sluice gate which is currently inoperable. The spillway, an overflow portion of the dam, is 86 ft. long with its crest 5.2 ft. below the top of the dam.

Based on visual inspection, the Schwartz Pond Dam is judged to be in fair condition. A feature found existing that could affect the stability of the dam is the deteriorating concrete at the wingwalls, regulating outlet and west dam embankment.

It is recommended that the owner arrange for a qualified registered engineer to do the following within one year of receipt of this report:

Inspect and evaluate the condition of concrete and masonry within the dam and appurtenant structures, and the contact zone between them and the ledge rock foundation. The pond should be lowered in order to enable a thorough inspection;

Determine the origin and significance of seepage under the sandstone wall at the east side of the dam.

It is recommended that the owner repair the wooden sluice gate and the winch mechanism of the regulating outlet within one year of receipt of this report. Other remedial measures contained in Section 7 should also be carried out within a period of one year.

As per the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, the Schwartz Pond Dam is classified as 'small' in size with 'low' hazard potential. A test flood equal to 100-year frequency event was selected in accordance with the Corps of Engineers' Guidelines. The calculated test flood inflow of 9,500 cfs results in a routed outflow of 9,400 cfs. The spillway capacity is 3,300 cfs with water level at the top of the dam. The spillway is capable of passing 35% of the routed test flood outflow. The storage capacity of the pond up to the top of the dam is 150 ac. ft. and up to the test flood level is 190 ac. ft.

An operation and maintenance manual to take care of normal routine procedures should be prepared.

GOODKIND & O'DEA INC.
AND
SINGHAL ASSOCIATES
(J.V.)

RAMESH SINGHAL, Ph.D., P.E.
(Singhal Associates)

LAWRENCE J. BUCKLEY, P.E.
(Goodkind & O'Dea Inc.)

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation: however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the

present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there by any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the pulic. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

TABLE OF CONTENTS

APPENDICES

GOODKIND & O'DEA INC.–SINGHAL ASSOCIATES(J.V.) ENGINEERS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

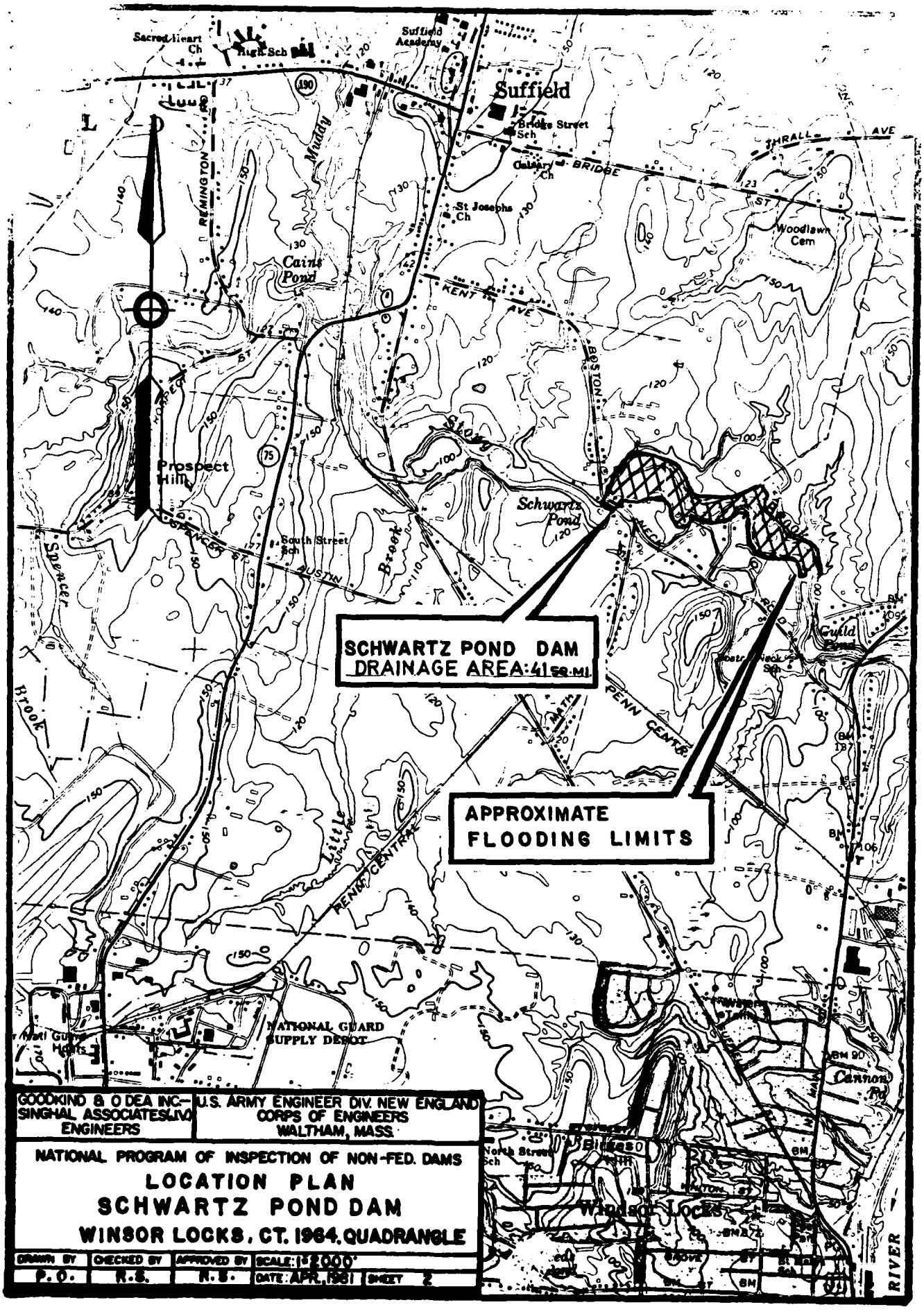
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

OVERVIEW PHOTO OF DAM

SCHWARTZ POND DAM

SUFFIELD, CONNECTICUT

DRAWN BY	CHECKED BY	APPROVED BY	SCALE: NONE	
E.T.K.	A.A.W.	L.J.B.	DATE: APR., 1981	SHEET 1


SCHWARTZ POND DAM
DRAINAGE AREA: 41 SQ. MI.
APPROXIMATE
FLOODING LIMITS
Suffield
Suffield Academy
Sacred Heart Ch
High Sch
Bridge Street Sch
Calvary Ch
St Josephs Ch
Woodlawn Cem
Muddy
Cains Pond
Prospect Hill
Schwartz Pond
Stony Brook
South Street Sch
Spencer Brook
Little Brook
Penn Central
Penn Central
NATIONAL GUARD SUPPLY DEPOT
Guild Pond
North Street Sch
Windsor Locks
Cannon Rd
RIVER
REMINGTON
THRALL AVE
BRIDGE ST
KENT AVE
BOSTON
SPENCER ST
ALSTN
MECH
MAIN
PENN CENTRAL
GOODKIND & O'DEA INC.—SINGHAL ASSOCIATES, LTD. ENGINEERS
U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
LOCATION PLAN
SCHWARTZ POND DAM
WINSOR LOCKS, CT. 1964 QUADRANGLE
DRAWN BY P.O.
CHECKED BY R.S.
APPROVED BY R.S.
SCALE: 1" = 2000'
DATE: APR. 1981
SHEET 2

PROJECT INFORMATION
Section 1

1.1 GENERAL

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Goodkind & O'Dea Inc., Hamden, Conn. and Singhal Associates, Orange, Connecticut (Joint Venture) have been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Goodkind & O'Dea Inc. and Singhal Associates (J.V.) under a letter of December 9, 1980 from Colonel William E. Hodgson, Jr., Corps of Engineers. Contract No. DACW 33-81-C-0022 dated December 9, 1980 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection

The purposes of the program are to:

1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring

correction in a timely manner by non-federal interest.

2. Encourage and prepare the States to quickly initiate effective dam inspection programs for non-federal dams.

3. To update, verify and complete the National Inventory of dams.

1.2 DESCRIPTION OF PROJECT

The Schwartz Pond Dam is located on Stony Brook, which flows into the Connecticut River approximately 1½ miles downstream from the dam. The location is approximately 1½ miles south from Suffield Town Hall and 1 mile southeast of the intersection of Route 75 and Suffield Street. The geographic location of the site may be found on the Windsor Locks Quadrangle Map, with coordinates of latitude N 41° 57.8' and longitude W 72° 38.3'.

The Schwartz Pond is impounded by a masonry and concrete dam approximately 128 ft. long out of which an 86 ft. length is the spillway section. The dam embankment extends 15 ft. east and 26 ft. west of the spillway. In addition, there are two concrete wingwalls and a 45 ft. concrete retaining wall as shown on the general dam plan in Appendix B. The top width of the dam is 2 ft. and height approximately 16 ft. The crest elevation of the spillway and the dam are 96.1 and 101.3 respectively, the freeboard being approximately 5.2 ft. The only regulating outlet for the dam is a 3'x4' opening through the east end of the dam with its invert approximately 7 ft. below the spillway crest and 3 ft. above the discharge channel. A wooden sluice

gate is located at the [illegible] of the outlet, controlled by an iron winch which is located on the eastern dam embankment (see photo 3).

The dam is classified as 'Small' as the height is 16 ft. and storage up to the top of the dam is only 150 ac. ft.

Hazard classification is 'low'. Dam failure analysis shows a peak release rate of only 5,400 cfs as against the test flood flow of 9,500 cfs which too does not cause any downstream hazard due to the high and steeply sloping banks of the Stony Brook.

The Schwartz Pond Dam is owned by:

Mitchell and Asunda Bryll
537 Boston Neck Road
Suffield, Conn. 06078
Telephone: (203) 668-2465

The purpose of the dam is recreational. There are no known records of any construction or post-construction changes. Unconfirmed reports say that originally the dam and spillway consisted of stone masonry and were utilized by mills located on each bank. In the 1920's, the masonry structure was supposedly overlaid with concrete. There was some damage to the structures during 1955 flood after which some repairs were done.

Currently there are no operational procedures like dam surveillance or recording of reservoir levels. The concrete

spillway needs no operational procedures. The 3'x4' regulating outlet located on the east side of the dam is inoperable.

1.3 PERTINENT DATA

a. Drainage Area

The drainage area consists of 41 square miles of flat terrain with an average slope under 1%. Elevations in the basin range from about 100 to 600 ft. MSL. A good part of the area is built up and inhabited with several town and State roads passing through it.

b. Discharge at Damsite

There is only one spillway facility 86 ft. wide located in the middle of the dam, with a crest elevation of 96.1.

1.	Outlet works	N/A
2.	Maximum known flood at damsite	Unknown
3.	Ungated spillway capacity at top of dam:	3,300 cfs
	Elevation:	101.3
4.	Ungated spillway capacity at test flood:	9,400
	Elevation:	103.6
5.	Total project discharge at top of dam:	3,300 cfs
	Elevation:	101.3
6.	Total project discharge at test flood:	9,400 cfs
	Elevation:	103.6

c. Elevation - (NGVD)

1.	Stream bed at toe of dam:	85.3
2.	Bottom of cutoff:	N/A
3.	Maximum tailwater:	N/A

4.	Normal pool:	96.2
5.	Full flood control pool:	96.1
6.	Spillway crest:	96.1
7.	Design surcharge:	N/A
8.	Top of dam:	101.3
9.	Test flood surcharge:	103.6

d. Reservoir - Length in Feet

1.	Normal pool:	2,000 ft.
2.	Flood control pool:	2,000 ft.
3.	Spillway crest pool:	2,000 ft.
4.	Top of dam:	3,000 ft.
5.	Test flood pool:	3,200 ft.

e. Storage - Acre Feet

1.	Normal pool:	75 ac. ft.
2.	Flood control pool:	75 ac. ft.
3.	Spillway crest pool:	75 ac. ft.
4.	Top of dam:	150 ac. ft.
5.	Test flood pool:	190 ac. ft.

f. Reservoir Surface - Acres

1.	Normal pool:	11.5 acres
2.	Flood control pool:	11.5 acres
3.	Spillway crest pool:	11.5 acres
4.	Top of dam:	19.0 acres
5.	Test flood pool:	21.5 acres

g.	Dam	
1.	Type:	masonry and concrete
2.	Length:	128 ft.
3.	Height:	16 ft.
4.	Top width:	2 ft.
5.	Side slopes:	Upstream -assumed vertical Downstream - varies from vertical to 1 horizontal to 3 vertical
6.	Zoning:	N/A
7.	Impervious core:	N/A
8.	Cutoffs:	N/A
9.	Grout curtain:	N/A
10.	Other:	-
h.	Diversion and Regulating Tunnel:	N/A
i.	Spillway	
1.	Type:	masonry and concrete overflow section.
2.	Length of crest:	86.3 ft.
3.	Crest elevation w/flashboards: wo/flashboards:	 N/A 96.1
4.	Gates:	N/A
5.	Upstream channel:	N/A
6.	Downstream channel:	Stony Brook (natural channel)
7.	General	-

j. Regulating Outlets:

1. Invert:	89.0
2. Size:	3 ft. x 4 ft.
3. Description:	Concrete sluice outlet
4. Control Mechanism:	Wooden sluice gate located on upstream side of outlet, controlled by iron winch situated on top of east dam embankment. Sluice gate is currently inoperable.

ENGINEERING DATA
Section 2

2.1 Design Data

There is no available design data.

2.2 Construction Data

There is no available construction data.

2.3 Operational Data

There is no available operational data.

2.4 Evaluation of Data

a. Availability

There is no available engineering data.

b. Adequacy

The engineering data available is inadequate to be of any assistance in the evaluation of the performance of the dam.

c. Validity

Due to the absence of any engineering data, the validity of the data cannot be assessed.

VISUAL INSPECTION
Section 3

3.1 Findings

a. General

The formal field inspection took place December 17, 1980 by engineers from Goodkind & O'Dea, Inc., and Singhal Associates. Detailed checklists, which are included in Appendix A, were utilized for the inspection of the dam and spillway. Photographs showing the dam features and problem areas were also taken during the inspection and are given in Appendix C along with the photo location plan.

Based upon the visual inspection, the general condition of the project was 'fair' with some areas requiring repair work and/or monitoring. At the time of the inspection the pool level of Schwartz Pond was approximately 96.2 ft. (NGVD) which was one-tenth of a foot above the spillway crest elevation.

b. Dam

Schwartz Pond Dam is a masonry and concrete structure approximately 128' long consisting of a 86.3' spillway, with the dam embankment extending 15' east and 26' west of the spillway. In addition, there are two concrete wingwalls, and a 45' concrete retaining wall as shown on the general dam plan in Appendix B. The horizontal and vertical alignments of these dam features appeared good with no signs of movement or settlement as shown in Photos, 1, 2 and 3.

The east concrete dam embankment and the 45 ft. concrete retaining wall were generally in good condition, with no evidence of any cracking or spalling. Extending from the east dam embankment, the concrete wingwall was in poor condition as shown in Photo 4. The lower north corner of the wingwall is broken and the concrete is moderately spalled with additional deterioration at the junction of the outlet works and wingwall.

Seepage was observed under the sandstone wall, east of the spillway, as noted on the general dam plan in Appendix B. The seepage flowed steadily, but was small and appeared to be free of any soil particles. A 12 ft. portion of this sandstone wall, which is abutting the stone slope, was also observed to be tilting forward (See general dam plan in Appendix B).

As shown in Photo 5, the concrete wingwall west of the spillway was in fair condition with no visible cracks. The bottom portion of the wingwall appeared to have been recently repaired with no apparent voids underneath; however, the north end of the wingwall did show signs of continuing deterioration (See Photo 7). At the junction of this wingwall and the west concrete dam embankment, moderate deterioration was observed as shown in Photo 6. Some efflorescence was also noted at the construction joints of the west dam embankment as shown on the general dam plan in Appendix B. The area

immediately downstream of this embankment was void of fill and at much lower elevation than the bottom of the pond (See Photo 7).

It appears that the entire dam, including the spillway, is founded on rock base. The contact zone between the rock and the bottom of the concrete structures and the structures themselves could not be inspected due to the full pool with the water flowing over the spillway.

c. Appurtenant Structures

Spillway

The concrete spillway was generally in good condition as shown in Photos 2 and 3. Exposed coarse aggregate along the spillway and two minor cracks on the crest were observed as noted on the general dam plan in Appendix B. Any seepage that may flow through or under the spillway could not be inspected due to the water flowing over the spillway.

Schwartz Pond, which serves as the upstream channel to the spillway, was in good condition with no accumulation of debris. A small island with a few overhanging trees was the only spillway obstruction noted (See Photo 2).

The channel immediately downstream of the spillway was also in good condition. The floor of the downstream channel was rocky and clean, with a few overhanging trees.

Regulating Outlet

The only regulating outlet for the dam is a 3' x 4' sluice through the east end of the dam with an invert approximately 7' below the spillway crest and 3' above the discharge

channel. A wooden sluice gate is located at the entrance of the outlet and controlled by an iron winch, which is situated on top of the eastern dam embankment (See Photo 3).

The 3' x 4' outlet was in poor condition with moderate deterioration of the concrete around the outlet opening. A scour pocket, approximately 2' deep was noted immediately beyond the outlet in the rock ledge. In the closed position and leaking an appreciable amount of water, the wooden sluice gate is not connected to the iron winch and, therefore, inoperative.

d. Reservoir Area (Schwartz Pond)

The reservoir is located in a partially developed, wooded area with numerous trees overhanging the shore. The few residential homes in close proximity to the pond are situated on high ground.

e. Downstream Channel (Stony Brook)

The channel downstream of the dam is a natural rocky bottom brook with several ledge outcrops along the downstream route. The general condition of the channel is very good with no accumulation of debris. Located approximately 120' downstream of the dam is a masonry and concrete bridge with a 24" cast iron sewer pipe hanging from the structure (See Photo 8).

3.2 Evaluation

The general condition of Schwartz Pond Dam is fair, as assessed by the visual inspection. The following features could influence the future condition and/or stability of the dam:

1. Additional deterioration of the concrete wingwall east of the spillway may greatly increase the possibility of failure of the east concrete dam embankment.
2. Further deterioration of the concrete regulating outlet and the wooden sluice gate could result in increased leakage which may promote further deterioration of the east wingwall.
3. Additional deterioration of the west concrete dam embankment at the junction of the west wingwall will increase the possibility of the failure of these structures.
4. The inoperative condition of the wooden sluice gate at the regulating outlet prevents the lowering of the pool which is required to properly inspect the dam embankment and spillway.

OPERATIONAL AND MAINTENANCE PROCEDURES
Section 4

4.1 Operational Procedures

a. General

At this time, there are no operational procedures, such as dam surveillance or reservoir level readings. The concrete spillway was designed to be uncontrolled and, therefore, would not require any operational procedures.

The regulating outlet located on the east side of the dam is presently inoperative. When the outlet mechanism was working, the wooden sluice gate normally would have remained closed. The sluice gate was last opened during the Spring of 1980 when the 24" sewer pipe was built under Stoney Brook upstream of the dam.

b. Description of any Warning Systems in Effect

There are no warning systems in effect.

4.2 Maintenance Procedures

a. General

Schwartz Pond Dam is maintained by Mitchell Bryll, the owner. The maintenance procedures, which are very informal, primarily consist of the routine removel of logs and debris from the upstream and downstream channels of the spillway.

b. Operating Facilities

At this time, there are no maintenance procedures for the regulating outlet which is presently inoperative.

4.3 Evaluation

The operational and maintenance procedures of Schwartz Pond Dam are poor. The present condition of the dam substantiates the need for formal operational and maintenance procedures with continuing records, which should be developed by the owner. A list of recommended procedures for the operation and maintenance of the dam is given in Section 7.

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES
Section 5

5.1 GENERAL

The pond has a contributory watershed area of 41 square miles which is practically flat with average slope under 1%. A good part of this area is built up and inhabited, with several town and State roads passing through it.

The Schwartz Pond Dam is a masonry and concrete structure with a maximum height of 16 ft. It has an inoperable 3'x4' low level outlet with an invert approximately 7 ft. below the spillway crest. An 86 ft. length of the dam with crest elevation 96.1 acts as overflow spillway section. Crest elevation of rest of dam is 101.3 which is 5.2' higher than the crest elevation of the spillway. The spillway capacity is 3,300 cfs before overtopping of the dam occurs. The spillway capacity at the routed test flood elevation of 103.6 is 9,400 at which stage the dam is overtopped by 2.3 ft.

5.2 DESIGN DATA

No records are available concerning design data.

5.3 EXPERIENCE DATA

There are no records of pond levels or extent of any overtoppings of the dam.

5.4 TEST FLOOD ANALYSIS

Based on dam failure analysis and impact from test flood, the Schwartz Pond Dam is classified as 'Low' hazard potential

in accordance with Table 2 on page D-9 of the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams. The dam being 'small' in size and with 'low' hazard potential, the test flood was taken to be equal to the 100-year frequency flood.

The 100-year frequency flood for 41 square miles contributory drainage area, came out as 9,500 cfs using the Connecticut Flood Flow Formula:

$$Q \text{ mean} = 0.85 \text{ AS} = 0.85 \times 41 \times 53 = 1{,}850 \text{ cfs}$$

and $Q\ 100 = 5 \times Q \text{ mean} = 5 \times 1850 = 9{,}300$ cfs (say 9,500 cfs)

The routed flow worked out as 9,400 cfs. The spillway capacity up to the top of the dam is 3,300 cfs which is only 35% of the routed test flood.

5.5 DAM FAILURE ANALYSIS

A dam failure analysis was made using the guidelines provided by the Corps of Engineers. Failure of the dam was assumed with water level at the top of the dam elevation 101.3. A 50 ft. wide and 16 ft. high breach resulted in a peak release rate of 5,400 cfs which is less than the routed test flood of 9,400 cfs. The dam failure will therefore produce less hazardous conditions than the test flood flow if the dam does not fail.

The height of the flood wave came out approximately 9 ft. at the first cross-section (Station 5+0). Two additional cross-sections at 2,700 ft. and 5,000 ft. downstream from the dam were also analyzed Computations are included in Appendix D. There

is no flood hazard under test flood conditions except partial flooding of one house. The dam breach flood flow being smaller than test flood will not cause additional flooding.

EVALUATION OF STRUCTURAL STABILITY
Section 6

6.1 Visual Observations

The visual inspection revealed no immediate structural stability problems at this time; however, two areas of major concern were noted.

The additional deterioration of the east wingwall would greatly diminish the structural stability of the east concrete dam embankment. Increased deterioration of this wingwall would lead to the erosion of the earth embankment on the downstream side of the dam. The deterioration of this wingwall is being accelerated by the leaky wooden sluice gate at the regulating outlet. The continuous action of the flowing water is gradually eroding the concrete from the east wingwall and outlet structure.

One area of minor concern noted was the void space downstream of the west concrete dam embankment. There is additional strain on this concrete structure due to the higher upstream pond bottom elevation.

It appears that the entire dam embankment, including the spillway, is founded on rock base. The condition of these structures at the contact zone with the rock and the structures themselves could not be inspected due to the pool level and water flow over the spillway; therefore, a visual assessment of the condition could not be made at this time.

6.2 Design and Construction Data

There is no design or construction data available; therefore, an analysis of the structural stability could not be made.

6.3 Post Construction Changes

There are no known records of any post construction changes; however, through an informal conversation with a local resident the following changes and/or repairs were made to Schwartz Pond Dam. Originally the dam and spillway consisted of stone masonry, and were utilized by mills once located on each side. In the late 1920's the masonry structure was supposedly overlaid with concrete that still exists. During the visual inspection there was no evidence of this being the case, but since the pool level and/or water flow obscured most of the structure, a final conclusion could not be made at that time. Unknown repairs were also made to dam after its being damaged by the 1955 Flood.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with Corps of Engineers' guidelines does not warrant further seismic analysis at this time.

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES
Section 7

7.1 Project Assessment

a. Condition

Based upon the visual inspection of the site and past performance, the dam appears to be in fair condition. There was no evidence of any immediate structural instability problems; however, there are areas of concern requiring repair work and/or monitoring as noted in Sections 7.2 and 7.3.

Based upon "Preliminary Guidance for Estimating Maximum Probable Discharge" dated March, 1978, peak inflow to the lake is 9,500 cfs; peak outflow is 9,400 cfs, with the water level 2.3 feet above the dam crest. Based upon our hydraulic computations, the spillway capacity with the lake level to the top of dam is 3,300 cfs, which is equivalent to approximately 35% of the routed test flood outflow.

b. Adequacy of Information

The information available is such that an assessment of the condition and stability of the dam had to be based only on the visual inspection.

c. Urgency

It is recommended that the measures presented in Section 7.2 and 7.3 be implemented within one year of the owner's receipt of this report.

7.2 Recommendations

It is recommended that the owner employ a qualified registered engineer to:

1. Inspect and evaluate the condition of the concrete dam structures and the contact zone between the structures and rock base. The water level in the pond should be lowered so that a thorough inspection can be completed.
2. Determine the origin and significance of seepage under the sandstone wall located on the east side of the dam.

The owner should implement the recommendations of the engineer.

7.3 Remedial Measures

a. Operation and Maintenance Procedures

The following measures should be undertaken within the time period indicated in Section 7.1.c., and continued on a regular basis.

1. A formal program of operation and maintenance procedures should be instituted and fully documented to provide accurate records for future reference.
2. Repair the wooden sluice gate and the winch mechanism of the regulating outlet.
3. Repair the areas of concrete deterioration at the east and west wingwalls, the regulating

outlet and the west dam embankment.

4. Fill in the void area immediately downstream of the west concrete dam embankment with earth.

7.4 Alternatives

This study has identified no alternatives to the above recommendations.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT Schwartz Pond Dam

DATE 12/17/80

TIME Morning

WEATHER Sunny 20s

W.S. ELEV. _____ U.S. _____ D.S.

PARTY:	DISCIPLINE:
1. Ramesh P. Singhal (RS)	Hydraulics
2. Ed Henderson (EH)	Geotechnical
3. Wesley J. Wolf (WW)	Hydraulics
4. Gerald Buckley (GB)	Soils & Structures
5.	

PROJECT FEATURE	INSPECTED BY
1. Dam Embankment	RS, EH, WW, GB
2. Spillway	RS, EH, WW, GB
3. Regulating Outlet	RS, EH, WW, GB
4.	
5.	
6.	
7.	
8.	
9.	
10.	

PERIODIC INSPECTION

PROJECT Schwartz Pond Dam DATE 12/17/80

PROJECT FEATURE Dam Embankment including Miscellaneous Walls NAME RS, EH, WW, GB

DISCIPLINE _____ NAME _____

AREA ELEVATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	101.3' ± (NGVD)
Current Pool Elevation	96.2' ± (NGVD)
Maximum Impoundment to Date	Unknown
Surface Cracks	None Observed
Pavement Conditions	N/A
Movement or settlement of crest	None Observed
Lateral movement	None Observed
Vertical alignment	Looks Good
Horizontal alignment	Looks Good
Conditions at abutment & at Concrete Structures	Some Concrete Deterioration of Wingwalls
Indications of Movement of Structural Items on Slopes	Stone Wall Tilted - East Side of Dam
Trespassing on Slopes	Pedestrian Only - No Sign of Damage
Sloughing or Erosion of Slopes or Abutments	None Observed
Rock Slope Protection-Riprap Failures	N/A
Unusual Movement or Cracking at or Near Toes	None Observed
Unusual Embankment or Downstream Seepage	Seepage Under Stone Wall at East Side of Dam
Piping or Boils	None Observed
Foundation Drainage Features	N/A
Toe Drains	N/A
Instrumentation System	N/A

PERIODIC INSPECTION CHECK LIST

PROJECT Schwartz Pond Dam DATE 12/17/80

PROJECT FEATURE Spillway Weir & Channels NAME RS, EH, WW, GB

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	No Specific Channel. Pond at Spillway
General Condition	Good - Island in Center
Loose rock overhanging channel	None
Trees Overhanging Channel	Few on Island & West Wall
Floor of Approach Channel	Silt Bottom - Clean
b. Weir ~~and trailing walls~~	Spillway is Monolithic Concrete
General Condition of Concrete	Fair
Rust or Staining	None Observed
Spalling	Minor - Erosion Exposing Coarse Aggregate
Any Visible Reinforcing	None
Any Seepage or Efflorescence	None Observed (Would be obscured by Water Flow)
Drain Holes	N/A
c. Discharge Channel	Natural Channel
General Condition	Clean
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	Few
Floor of Channel	Rocky, but Clean
Other Obstructions	Highway Bridge with Sewer Hung on Under Side

PERIODIC INSPECTION CHECK LIST

PROJECT Schwartz Pond Dam DATE 12/17/80

PROJECT FEATURE Regulating Outlet NAME RS, EH, WW, GB

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Features of Regulating Outlet That are Visible are
Rust or Staining	
Spalling	① Opening in Face of Dam Concrete is Deteriorated
Erosion or Cavitation	
Visible Reinforcing	② Front Face of Wooden Sluicegate - Leaking
Any Seepage or Efflorescence	
Condition at Joints	③ Inoperable Mechanism to Lift Gate
Drain Holes	
Channel	
Loose Rock or Trees Overhanging Channel	Same as Channel for Spillway
Condition of Discharge Channel	

Note: The Regulating Outlet Discharges Through 3'x4' Opening at East End of Dam. Bottom of Opening is 7' Below Spillway Crest. Wooden Gate is Visible Through Opening.

APPENDIX B

ENGINEERING DATA

ENGINEERING DATA CHECKLIST

ITEM	AVAILABILITY	LOCATION
LOCATION MAP	Available	USGS Map
AS-BUILT DRAWINGS	Not Available	
HYDROLOGIC & HYDRAULIC DATA	Not Available	
SOIL BORINGS	Not Available	
SOIL TESTING	Not Available	
GEOLOGY REPORTS	Not Available	
CONSTRUCTION HISTORY	Not Available	
OPERATION RECORDS	Not Available	
INSPECTION HISTORY	Not Available	
DESIGN REPORT	Not Available	
DESIGN COMPUTATIONS	Not Available	
HYDROLOGIC & HYDRAULIC	Not Available	
DAM STABILITY	Not Available	
SEEPAGE ANALYSIS	Not Available	

32 12/12/80 Sunny 20's T WJW ETK

SCHWARTZ POND DAM

	BS	H.I.	F.S	ELEV	
RM-9	4.85	06.54		101.69	NGVD
SHOT-1			6.33	100.21	
2			11.6	94.9	
3			6.19	100.35	
4			13.6	92.9	
5			5.2	101.3	
6			17.4	89.1	
7			10.99	96.10	
8			20.5	86.0	
9			10.92	95.62	
10			20.5	86.0	
11			15.=	91.0	
12			11.7	94.8	
13			7.5	99.0	
14			8.5	98.0	
15			20.1	86.4	
16			2.5	104.0	
17			4.10	102.4	
18			11.6	96.9	

B-2

33

CHISELED SQUARE ON THE SW CORNER OF 2ND STEP OF SW WINGWALL OF BOSTON NECK ROAD CROSSING OF STODEY BROOK (NGVD- NATIONAL GEODETIC VERTICAL DATUM - 1929) - FROM FLOOD INSURANCE STUDY OF TOWN OF SUFFIELD

12'N. FROM S END OF EAST RETAINING WALL

BOTTOM OF POND AT SHOT 1

N END OF EAST RETAINING WALL

BOTTOM OF POND AT SHOT 3

TOP OF E. WINGWALL AT SPILLWAY

BOTTOM OF POND AT SHOT 5

TOP OF SPILLWAY (EAST)

BOTTOM OF SPILLWAY (ROCK SHEET) (EAST)

TOP OF END OF EAST WINGWALL

STREAM BROOK AT SHOT 9

TOP OF STONE WALL E. OF E. WINGWALL

TOP OF END OF STONE WALL NE OF E. WING WALL

TOP OF SLOPE 25' E. OF SHOT 12

TOP OF GROUND BELOW SHOT 12

EDGE OF H_2O 35' W. OF SHOT 12

TOP OF SLOPE 25' E. OF SHOT 1

CENTER OF ROAD AT ℄ BRIDGE

STREAMBED S. OF BRIDGE AT E. ABUTMENT

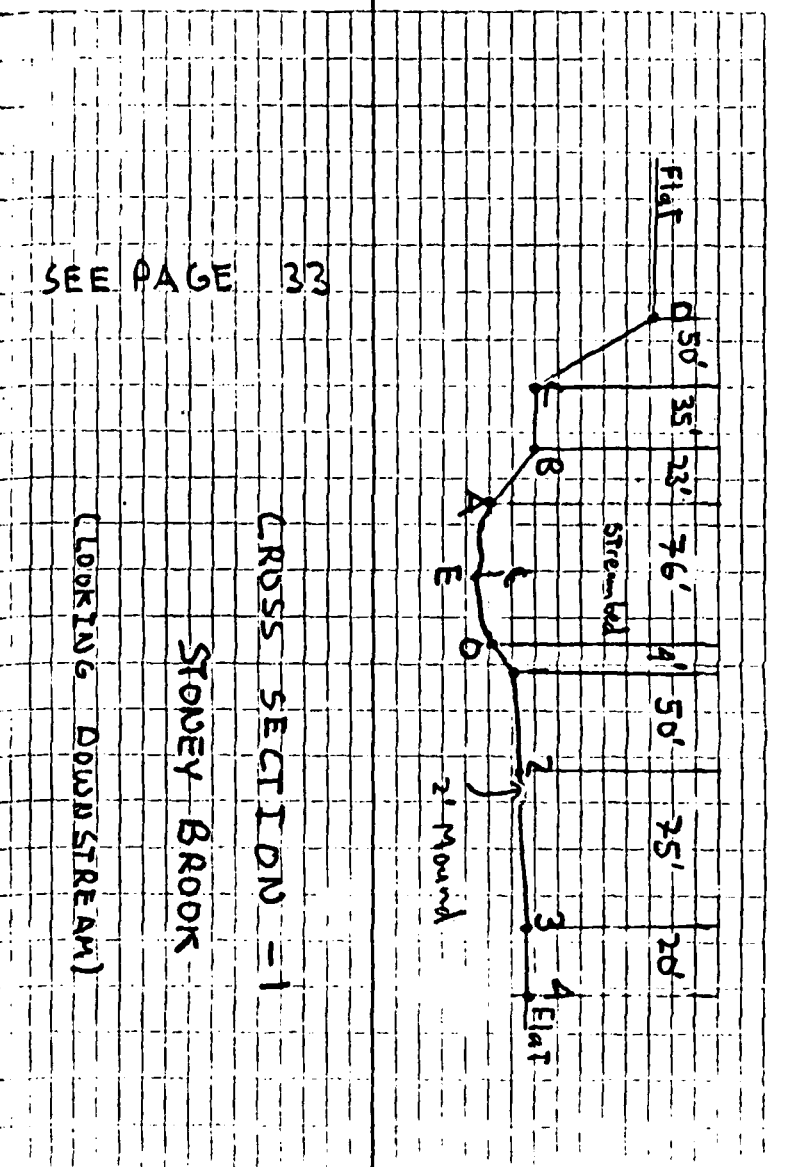
	B.S	HI 106.54	F.S	ELEV	
19			20.1	86.4	STREAM BED S. OF BRIDGE AT E. PIER
20			21.2	85.3	" " " " " " W. "
21			19.9	86.6	" " " " " " W. ABUTMENT
22			7.2	99.3	BOTTOM OF BRIDGE SUPERSTRUCTURE
23			12.98	93.56	TOP OF 2.17' O.D. C.I. SEWER PIPE AT E. pier
24			9.03	97.51	BOTTOM OF STRUCTURE HOLDING WOODEN WALKWAY, C.I. SEWER, & WATER PIP
25			6.7	99.8	TOP OF WOODEN WALKWAY
26			5.24	101.30	TOP OF W. RETAINING WALL & WINGWALL AT SPILLWAY (WEST)
27			10.39	96.15	TOP OF SPILLWAY (WEST)
28			21.2	85.3	BOTTOM OF SPILLWAY (WEST)
29			12.6	93.9	BOTTOM OF POND AT SHOT 26
30			11.47	95.07	TOP OF THE END OF THE W. WINGWALL
31			20.2	86.3	BOTTOM OF STREAM AT SHOT 30
32			4.8	101.7	TOP OF STONEWALL-1 (N. EDGE)
33			9.1	97.4	GROUND BELOW SHOT-32
34			3.8	102.7	TOP OF STONEWALL-2 (℄)
35			6.9	99.6	GROUND BELOW SHOT-34
36			5.4	101.1	TOP OF STONEWALL-3 (℄)
37			16.5	90.0	GROUND SHOT BELOW SHOT 36
38			10.2	96.3	EDGE OF H_2O at SHOT 26
39			19.6	86.9	EDGE OF H_2O 17' N. OF END OF W. WINGWALL
RM-9	4.87 ✓				See Page 33

2/23/81 [illegible], 40° TWJW J. ETK

SCHWARTZ POND DAM
DOWNSTREAM CROSS SECTIONS
STONEY BROOK

	B.S	HI	FS	Elev	
RM-9	.98	102.67		101.69	NGVD
TP-1	5.23	98.20	9.70	92.97	
TP-2	2.29	95.47	5.57	92.63	
CSI-0			13.1	82.4	
CSI-1			6.6	86.9	
CSI-2			5.9	90.1	
CSI-3			4.9	90.6	
CSI-4			2.8	89.7	
TP-3	15.67'	99.27	11.87	83.6	
CSI-A			15.7	83.6	
CSI-B			8.0	91.3	
CSI-C			5.5	93.8	
TP-4	24.62	118.32	6.51	93.76	
CSI-D			3.4	115.0	
TP-5	.10	112.12	.36	112.02	
RM-9			16.53	101.59	✓
CSI-E			6.9	81.4	

SEE PAGE 33



CROSS SECTION -1
CSI

38

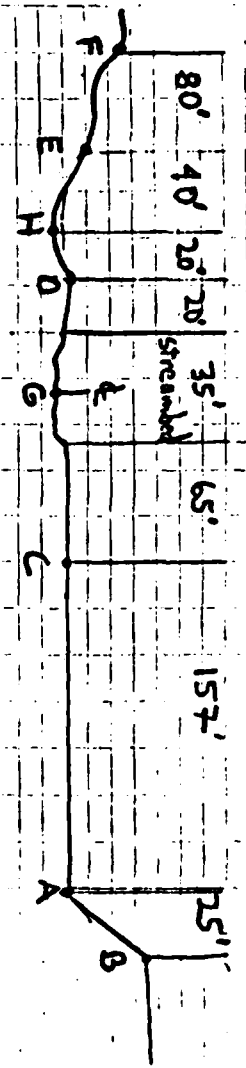
	B.S.	H.I.	F.S.	Elev
RM-9	1.09	102.73		101.69
TP-1	.28	93.61	9.40	93.33
TP-2	10.00	95.04	8.57	85.04
TP-3	5.90	82.52	18.42	76.62
CS2-A			7.6	74.9
CS2-B			-3.1	85.9
CS2-C			9.0	73.5
CS2-D			5.0	77.5
CS2-E			4.2	78.3
CS2-F			0.0	82.5
CS2-G			11.0	71.5
CS2-H			9.0	73.5

Continued on Page 40

See Page 23

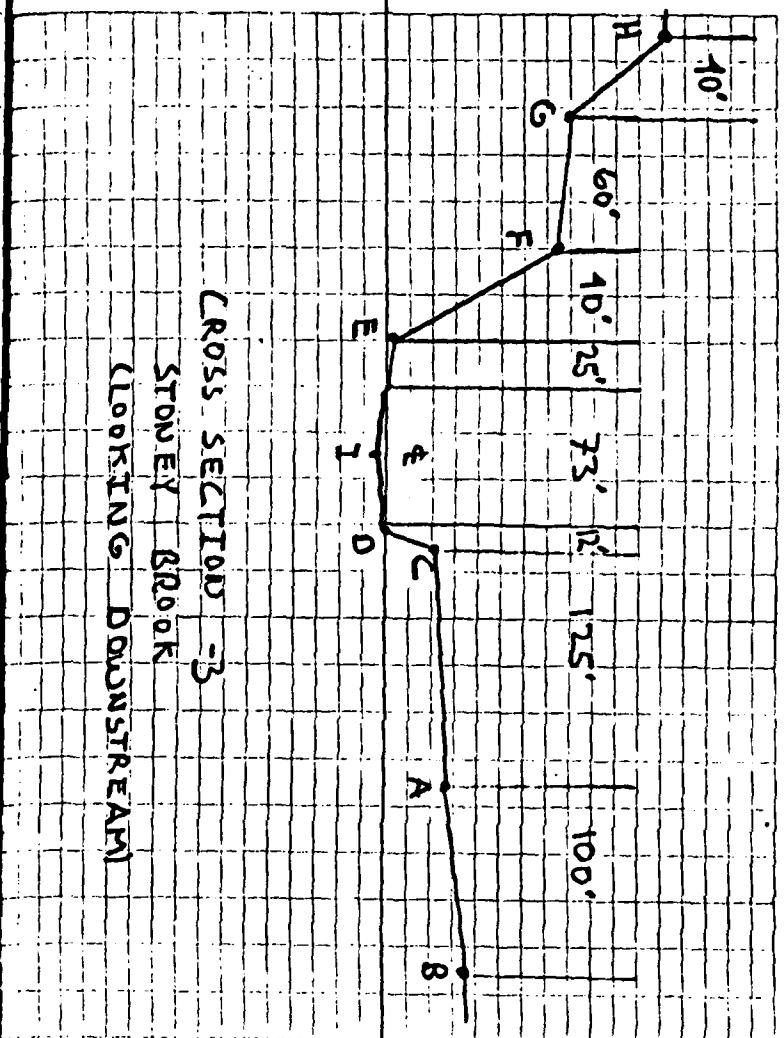
CROSS SECTION 2
STONEY BROOK
(LOOKING DOWNSTREAM)

39



CROSS SECTION 2
CS2

	B.S.	H.I.	F.S.	ELEV.
CONTINUED FROM PAGE 38				
		84.52		
TP-4	20.18	94.90	7.80	74.72
TP-5	7.90	92.80	10.00	84.90
TP-6	3.49	90.05	6.24	86.56
TP-7	1.69	78.93	12.81	77.24
TP-8	2.77	77.23	4.47	74.46
CS3-A			9.1	68.1
CS3-B			2.9	74.3
CS3-C			9.3	67.9
CS3-D			17.6	59.6
TP-9	13.95	87.46	3.72	73.51
CS3-E				61±
CS3-F			1.7	82.8
CS3-G				84±
CS3-H				96±
CS3-I				59±
TP-9	3.80	77.31		73.51
TP-10	6.77	77.29	6.79	70.52
TP-11	12.66	82.50	7.45	69.84
TP-12	2.33	76.28	8.55	73.95
MH-6			5.75	70.53



CROSS SECTION -3
STONEY BROOK
(LOOKING DOWNSTREAM)

TOP OF MANHOLE 5' NORTH OF REGION NECK ROAD, FRONT OF HOUSE # 872 (≈ 7015 from Suffolk Town Hall)

CROSS SECTION -3 CS3

2/23/81

SCHWARTZ POND DAM
3- DOWNSTREAM CROSS SECTIONS

Very steep ≈ 25' f[illegible] Top of sl[illegible] to stre[illegible] bed

WJW ↑
ETK ⊥

BIBLIOGRAPHY

1. "Recommended Guildelines for Safety Inspection of Dams", Department of the Army, Office of the Chief Engineers, Washington, D.C. 20314, 1979.

2. Design of Small Dams, Revised Reprint, United States Department of the Interior, Bureau of Reclamation, United States Government Printing Office, Washington, D.C.

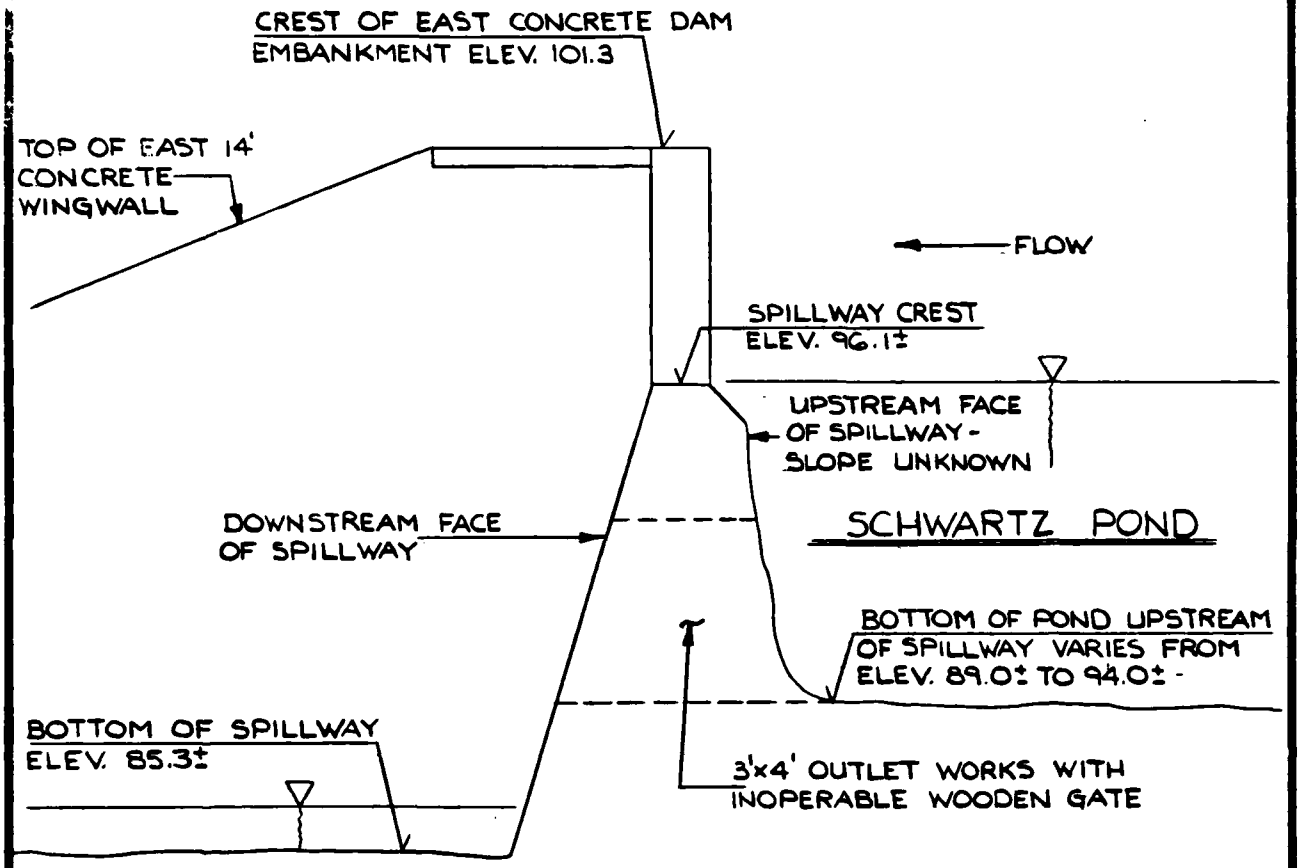
3. Soil Survey, Hartford County, Connecticut, United States Department of Agriculture, U.S. Government Printing Office, Washington 25, D.C. 1962

4. Donald M. Gray: Handbook on the Principles of Hydrology, Water Information Center, 1970.

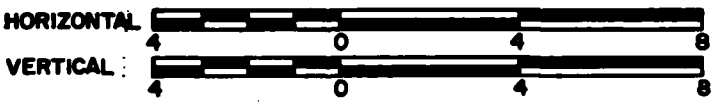
5. Hunter Rouse: Engineering Hydraulics, John Wiley and Sons, New York, 1950.

6. Victor L. Streeter: Fluid Mechanics, McGraw-Hill Book Company, Inc. 1958.

7. S.C.S. National Engineering Handbook, Hydrology Section 4, Soil Conservation Service, U.S. Department of Agriculture, 1972.



PROFILE OF SPILLWAY



NOTE:
ALL ELEVATIONS REFERENCED TO NGVD.

GOODKIND & O'DEA INC.—SINGHAL ASSOCIATES(J.V.) ENGINEERS	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

PROFILE OF SPILLWAY

SCHWARTZ POND DAM

SUFFIELD, CONNECTICUT

DRAWN BY	CHECKED BY	APPROVED BY	AS NOTED	
E.T.R.	W.J.W.	L.J.S.	APR., 1981	SHEET 8-2

APPENDIX C

DETAIL PHOTOGRAPHS

Photo 1 - View looking west along the dam and spillway.

Photo 2 - View of spillway from bridge. Note outlet works on left edge of spillway.

Photo 3 - View looking east across spillway.

Photo 4 - View of north end of east wingwall.
Note deteriorating concrete.

Photo 5 - View of spillway and west wingwall.

Photo 6 - View of southeast corner of west dam embankment. Note deteriorated concrete.

Photo 7 - View of northeast corner of west wingwall. Note deteriorated concrete.

Photo 8 - View of highway bridge and downstream channel (Stoney Brook). Note utility pipe suspended under bridge.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
(CIVIL, HYDRAULICS, SANITARY)
827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job SCHWARTZ POND DAM
Sheet Number D-1
Date 3-26-1981
By R.S.

TEST FLOOD

DRAINAGE AREA = 41.0 SQ. MILES

THE TERRAIN HAS AN AVERAGE SLOPE OF UNDER 1% THE DRAINAGE AREA CAN BE CLASSIFIED UNDER 'FLAT AND COASTAL' CATEGORY.

TAKING A FACTOR OF 840 FROM THE CORPS OF ENGINEERS' CHART,

PMF = 540 x 41
= 22,000 CFS.

SIZE AND HAZARD CLASSIFICATION

MAXIMUM HEIGHT OF THE DAM = 16 ft.
MAXIMUM IMPOUNDMENT UPTO TOP OF DAM = 150 AC·FT.

SIZE OF THE DAM = "SMALL"

THE HAZARD POTENTIAL IS 'LOW'. THE DAM BREACH COMPUTATIONS INDICATE THAT THERE IS NO ADDITIONAL FLOODING DUE TO DAM BREACH AS COMPARED TO TEST FLOOD CONDITIONS.

AS PER TABLE 3 PAGES D-12, D-13 OF THE 'RECOMMENDED GUIDELINES FOR SAFETY INSPECTION OF DAMS', THE RECOMMENDED TEST FLOOD WILL BE 50 TO 100 YEAR FREQUENCY FLOOD.

USING CONNECTICUT FLOOD FLOW FORMULA

$Q_{MEAN} = 0.85 \times A \times S$
$= 0.85 \times 41 \times 53 = 1850$ CFS

$Q_{100} = 5 \times 1850$
$= 9300$
SAY 9500 CFS

...OCIATES
...NEERS
...ANITARY)
...RANGE, CT 06477
...55-5562

Job SCHWARTZ POND D...
Sheet Number D-2
Date 3.26.1981
By R.S.

SPILLWAY CAPACITIES

THE SPILLWAY CONSISTS OF THE FOLLOWING:

1- 3'x4' REGULATING OUTLET WITH ITS BOTTOM AT ELEVATION 89.0

1- OVERFLOW SECTION OF DAM 86 FT. LONG CREST ELEV. 96.0

SPILLWAY CAPACITIES AT VARIOUS ELEVATIONS ARE TABULATED BELOW:

ELEVATION	CAPACITY - CFS		
	LOW LEVEL OUTLET 3'x4' SIZE $Q = 2.4 \times 3 \times (H_2^{3/2} - H_1^{3/2})$ CFS	OVERFLOW SECTION OF DAM $Q = 3.0 \times L \times H^{3/2}$ CFS	TOTAL - CFS
89.0	0.0	0.0	0.0
91.0	20.0	0.0	20.0
93.0	60.0	0.0	60.0
96.0	100.0	0.0	100.0
98.0	115.0	730.0	845.0
100.0	130.0	2070.0	2200.0
102.0	140.0	3960.0	4100.0
105 0	155.0	13845.0	14,000.0

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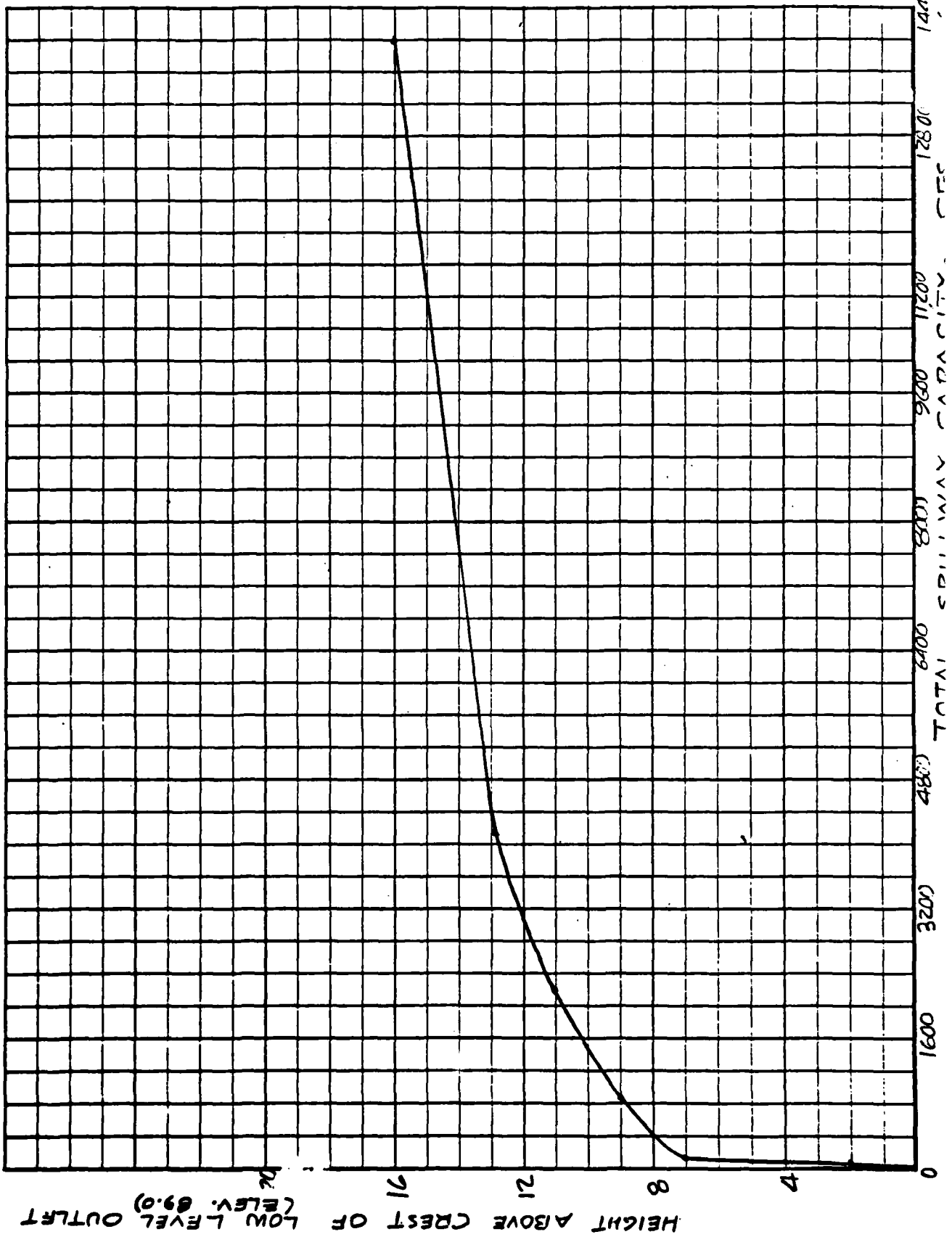
Job SCHWARTZ POND DA
Sheet Number D-3
Date 3-27-1981
By R.S

SPILLWAY CAPACITY CURVE



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Job SCHWARTZ POND DAM
Sheet Number D-4
Date 3.27.1981
By R.S.

SURCHARGE STORAGES & WATER SURFACE AREAS

RESERVOIR WATER SURFACE ELEVATION	HEIGHT ABOVE SPILLWAY CREST	WATER SURFACE AREA (ACS.)	SURCHARGE STORAGE CAPACITY (AC.-FT.)
96.0	0.0	11.5	0.0
98.0	2.0	14.4	22.0
100.0	4.0	17.2	43.0
102.0	6.0	19.5	93.0
105.0	8.0	23.0	143.0

N.B. STORAGE CAPACITY BELOW SPILLWAY CREST = 77 AC.-FT.

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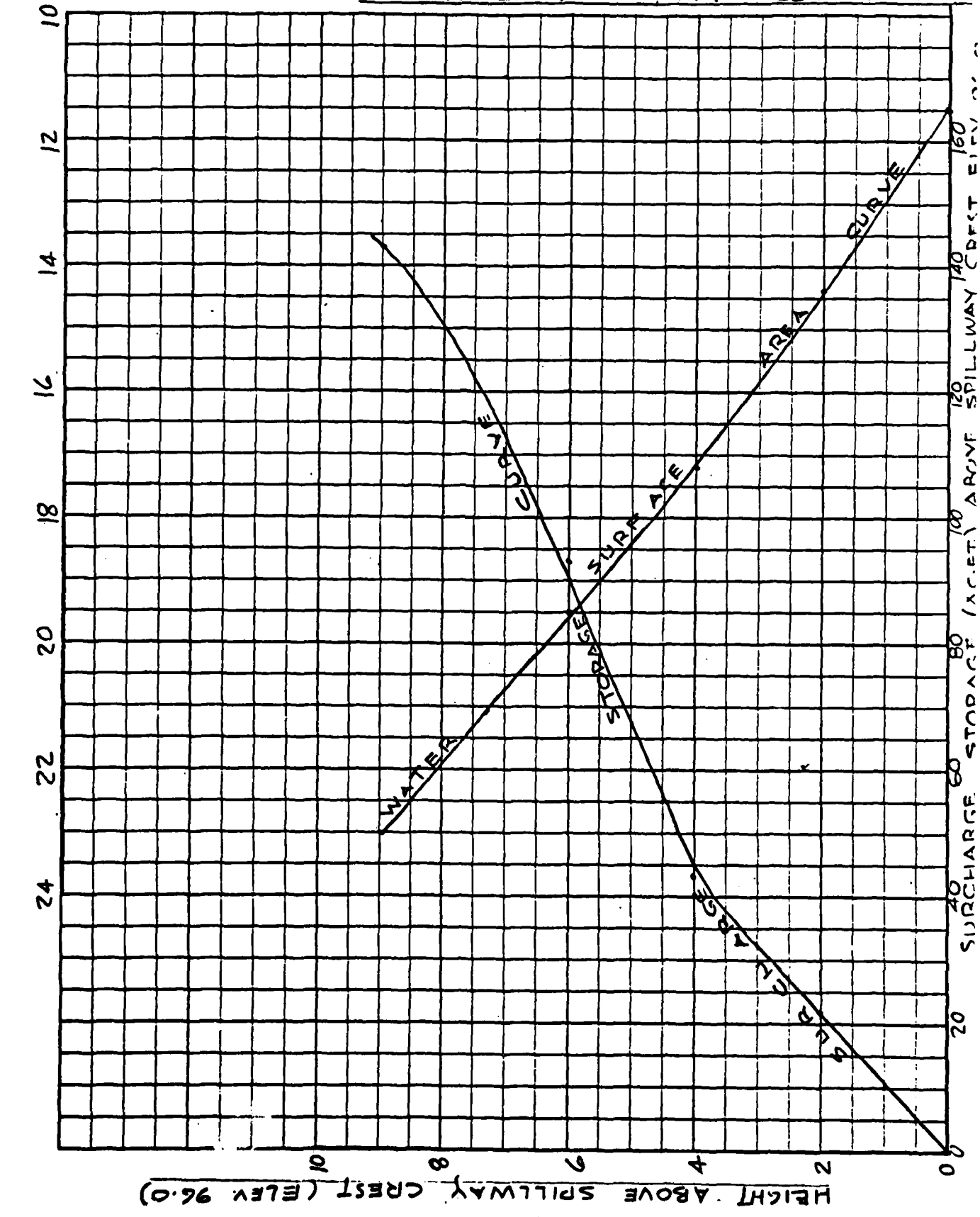
Job SCHWA[illegible] POND DA[illegible]
Sheet Number 5
Date 3·27·[illegible]81
By R.S.



SIGNAL ASSOCIATES
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827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job SCHWARTZ POND DAM
Sheet Number D-6
Date 3.27.1981
By R.S.

INFLOW, ROUTED OUTFLOW & ADEQUACY OF SPILLWAY CAPACITY

TEST FLOOD = 9,500 CFS.

SPILLWAY CAPACITY UPTO TOP OF DAM (ELEV. 101.3) = 3300 CFS

THIS IS INADEQUATE AND THE DAM WILL BE OVERTOPPED.

IN ORDER TO PASS THE TEST FLOOD, THE WATER LEVEL WILL RISE TO ELEVATION 103.6 WHICH IS 2.3 FT. ABOVE THE CREST ELEVATION OF THE DAM (101.3). THIS DOES NOT TAKE INTO CONSIDERATION, THE EFFECT OF SURCHARGE STORAGE.

EFFECT OF SURCHARGE STORAGE ON PEAK OUTFLOW

FOR Q_{P_1} = 9,500 CFS, HEIGHT ABOVE CREST OF SPILLWAY = 7.6 FT.

AND SURCHARGE STORAGE = 133 AC.FT.
WHICH CORRESPONDS TO A DEPTH

$$= \frac{133 \times 12}{41 \times 640} = 0.06''$$

$$Q_{P_2} = Q_{P_1}\left(1 - \frac{0.06}{7.0}\right) = 9500 \times 0.991$$
$$= 9{,}400 \text{ C.F.S.}$$

THE AVAILABLE STORAGE IS VERY SMALL AND THE OUTFL ALMOST EQUALS THE INFLOW.

THE DAM WILL BE OVERTOPPED BY APPROXIMATELY

$$103.6 - 101.3 = 2.3 \text{ FT.}$$

THE MAXIMUM SPILLWAY CAPACITY UPTO TOP OF THE DAM EQUALS 3,300 WHICH IS 35% OF THE ROUTED OUTFLOW RATE.

SINGHAL ASSOCIATES
CONSULTING ENGINEERS
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827 MAPLEDALE ROAD, ORANGE, CT 06477
TEL: (203) 795-6562

Job SCHWARTZ POND DAM
Sheet Number D-7
Date 3.27.1981
By R.S.

DAM FAILURE FLOOD FLOW

AS PER CORPS OF ENGINEERS' GUIDELINES:

$$Q_{P_1} = \frac{8}{27} \cdot W_b \cdot \sqrt{g} \cdot y_o^{3/2}$$

WHERE

Q_{P_1} = DAM FAILURE PEAK OUTFLOW IN CFS

W_b = BREACH WIDTH = 40% OF DAM LENGTH AT MID-HEIGHT.

Y_o = HEIGHT FROM STREAMBED TO POOL LEVEL AT FAILURE

SUBSTITUTING KNOWN VALUES OF W_b AND Y_o AS $0.4 \times 128' = 50$ FT, AND 16 FT. RESPECTIVELY - THE FAILURE ASSUMED WITH POOL AT TOP OF DAM ELEVATION 101.3 :

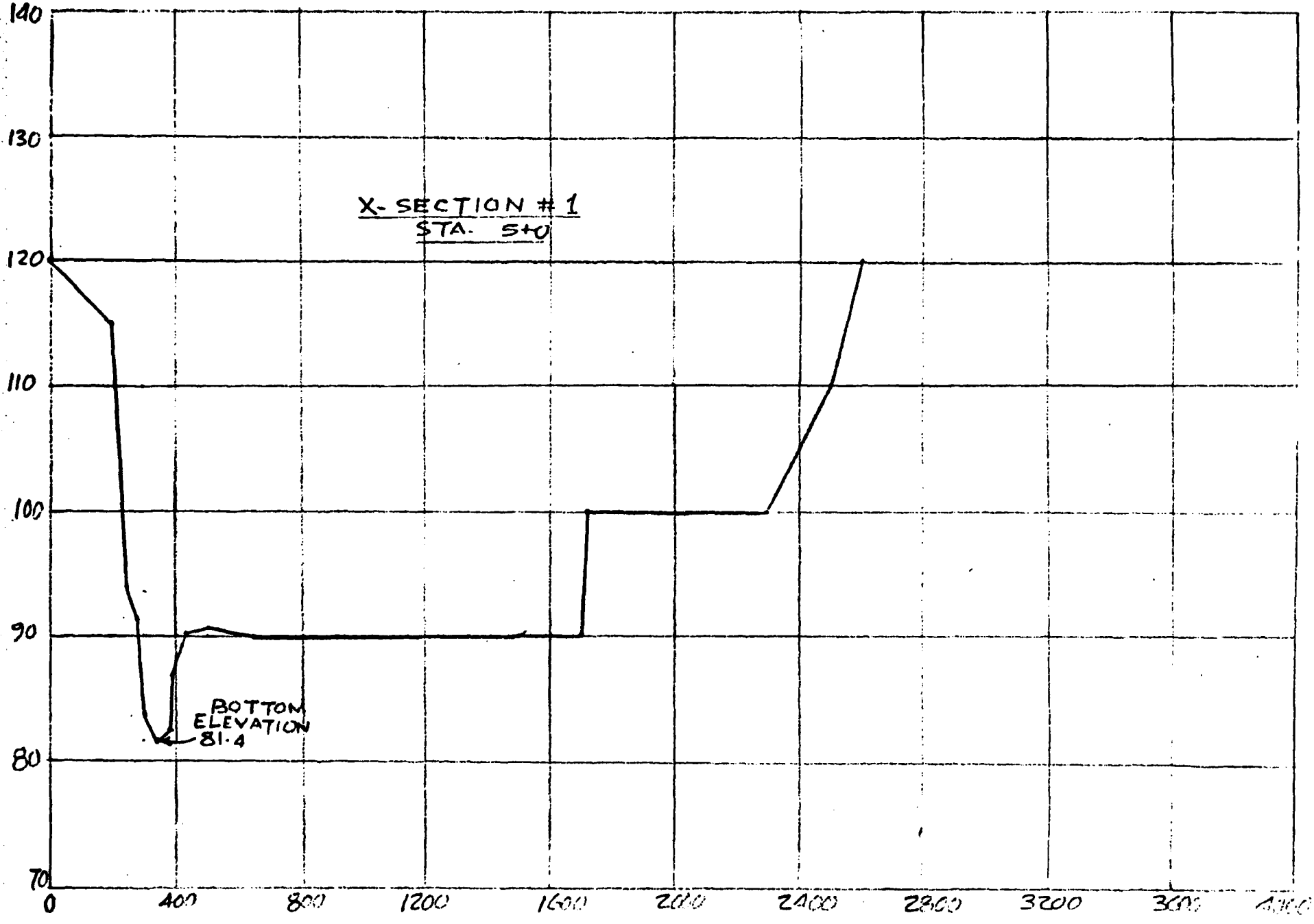
$$Q_{P_1} = \frac{8}{27} \times 50 \times \sqrt{32.2} \times 16^{3/2}$$

$$= 5{,}400 \text{ CFS (APPROX.)}$$

NOTE: THE ROUTED TEST FLOOD FLOW OF 9,400 CFS BEING LARGER IN VALUE, WILL BE USED FOR DOWNSTREAM HAZARD ANALYSIS.

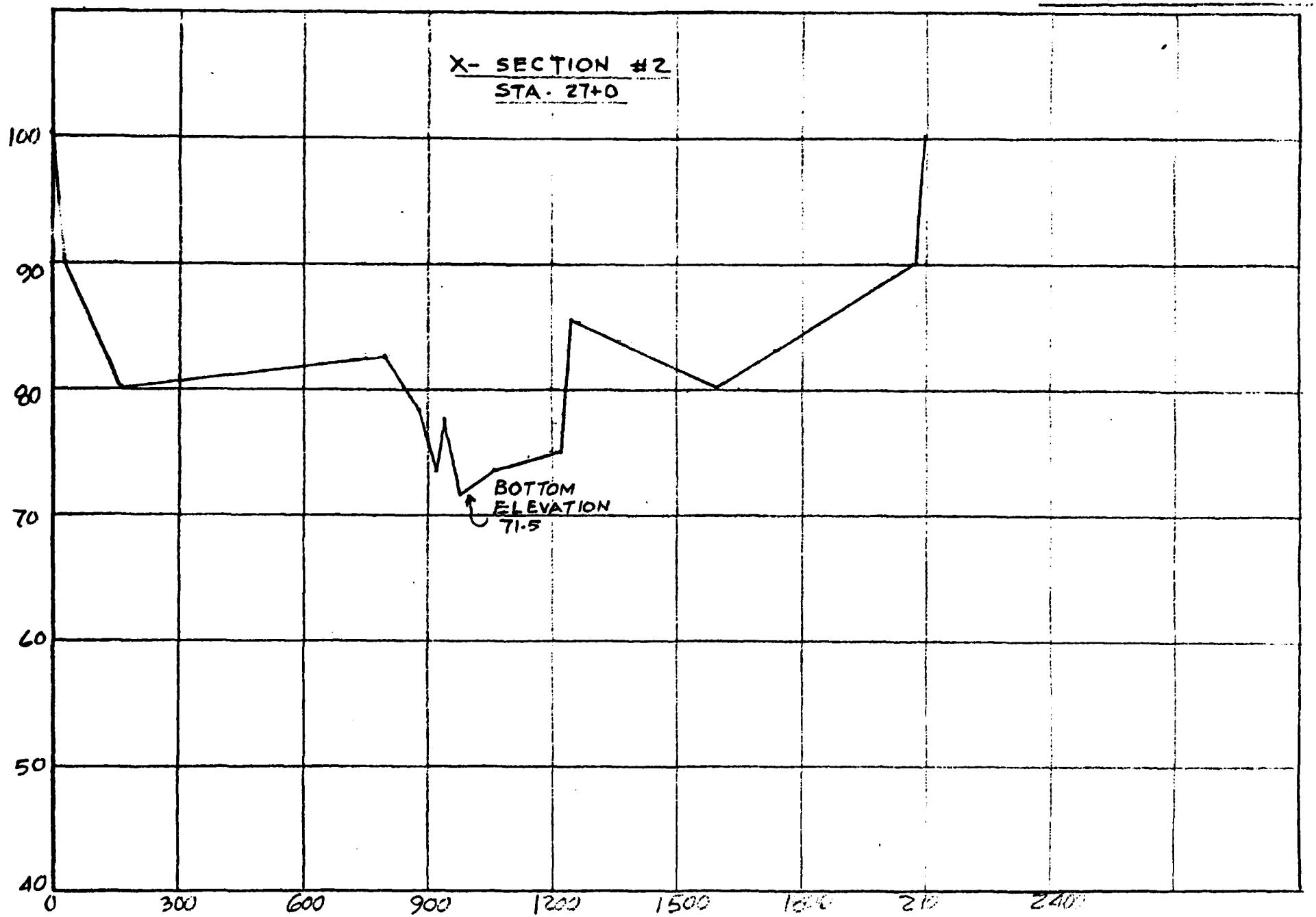
3.30.1981

SCHWARTZ POND DAM



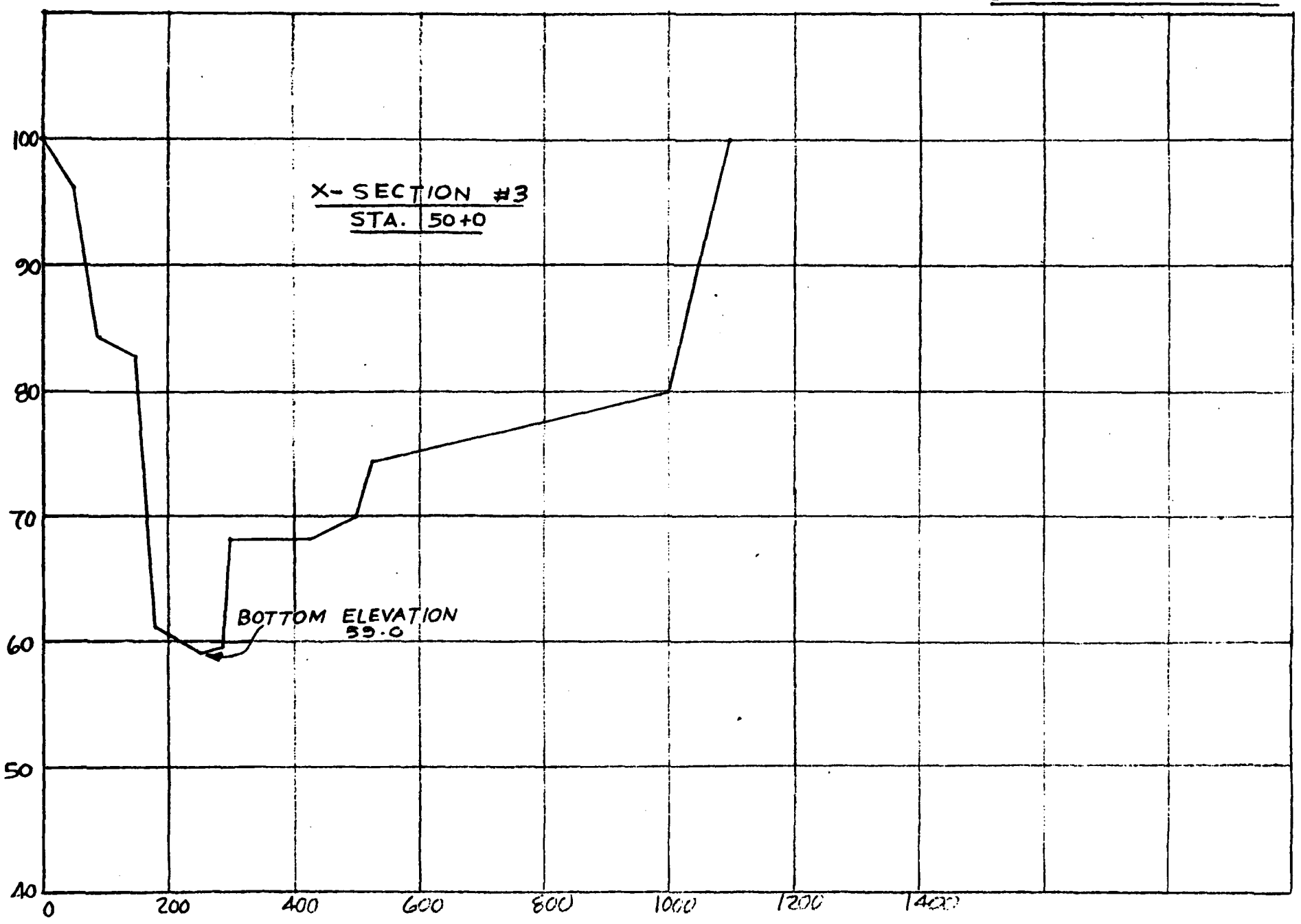
3.30.1981

SCHWARTZ POND DAM



3.30.1981

SCHWARTZ POND DAM



D-10

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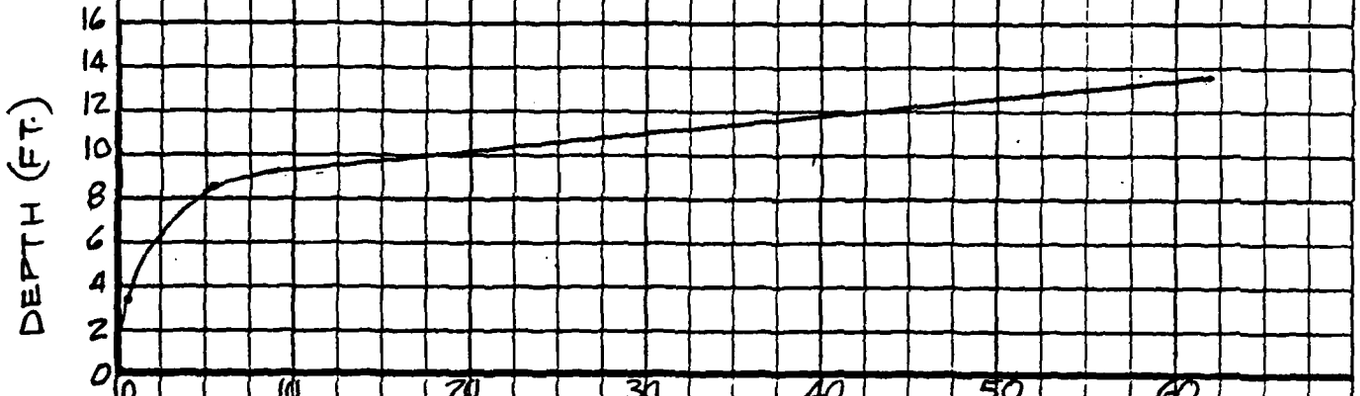
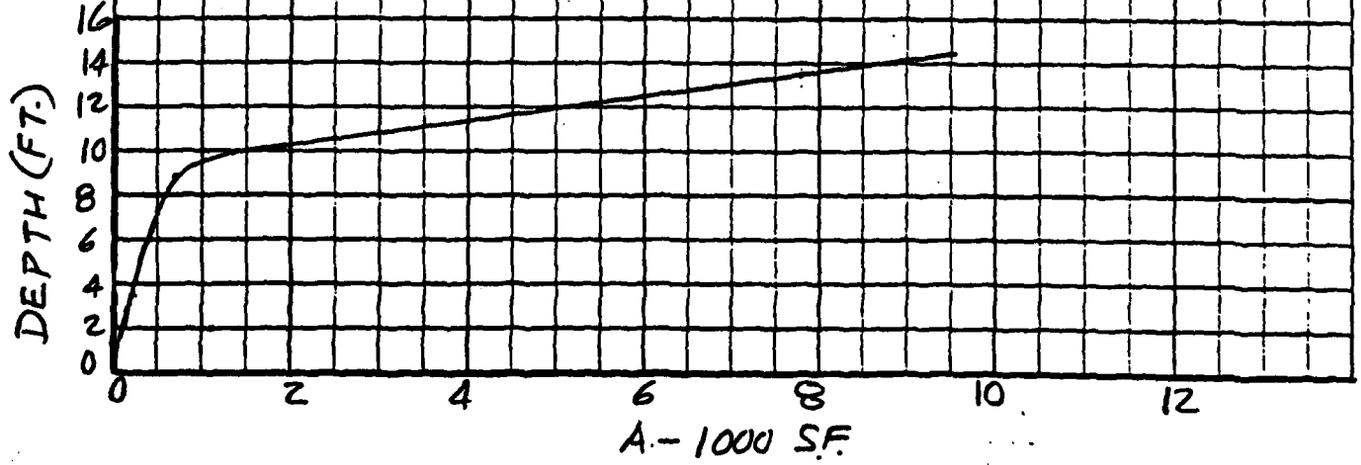
Job SCHWARTZ POND DAM
Sheet Number
Date 3-30-1981
By R.S.

DOWNSTREAM FLOOD HAZARD

X-SECTION #1 STA 5+0

ELEV (FT)	D (FT)	Pw (FT)	A (S.F.)	R (A/Pw) (FT)	S (FT/FT)	$V=1.486/n \, R^{2/3} S^{1/2}$ (FT./SEC)	Q (CFS)
85.0	3.6	80	200	2.5	0.0036	4.70	950
90.0	8.6	150	726	4.8		7.26	5,200
95.0	13.6	1450	7850	5.4		7.85	62,000





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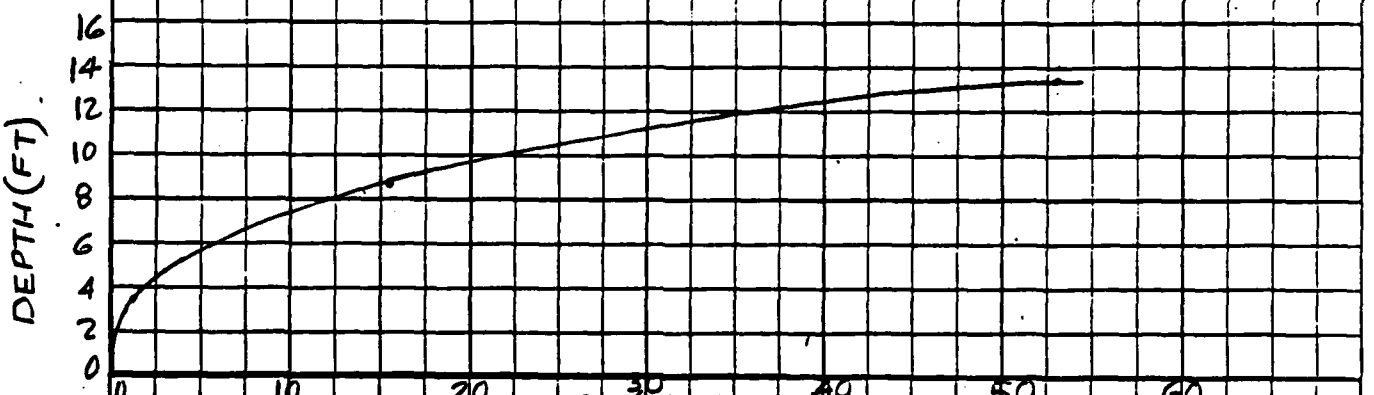
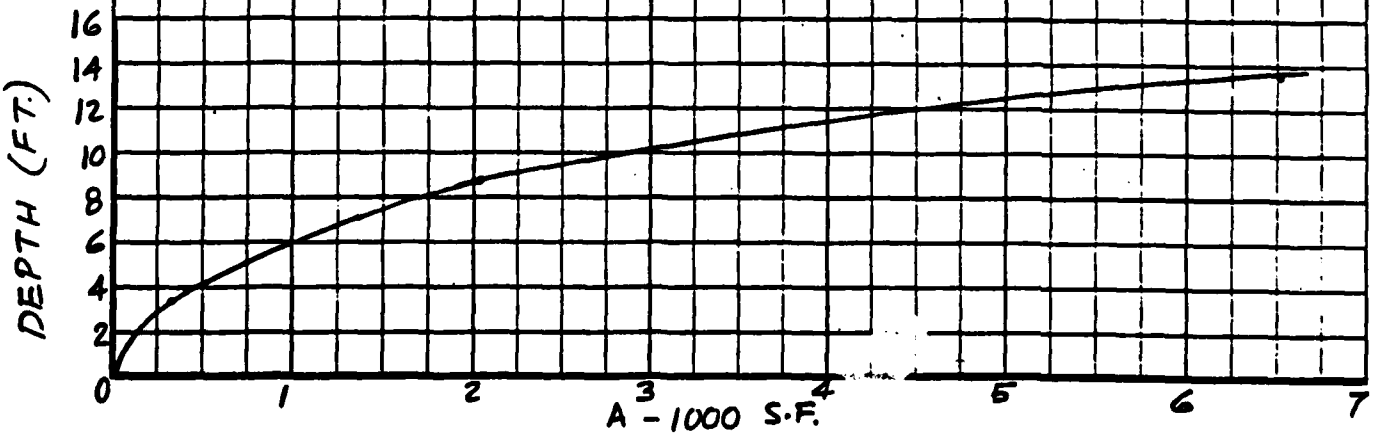
Job SCHWARTZ POND DA
Sheet Number
Date 3.30.1981
By R.S.

DOWNSTREAM FLOOD HAZARD

X-SECTION #2 STA 27+0

ELEV (FT)	D (FT)	Pw (FT)	A (S.F.)	R=A/Pw (FT)	S (FT/FT)	$V=\frac{1.486}{n}R^{2/3}S^{1/2}$ (FT./SEC.)	Q (CFS)
75.0	3.5	250	330	1.32		3.07	1015
80.0	8.5	400	2040	5.10	0.0036	7.56	15,400
85.0	13.5	1150	6540	5.69		8.13	53000





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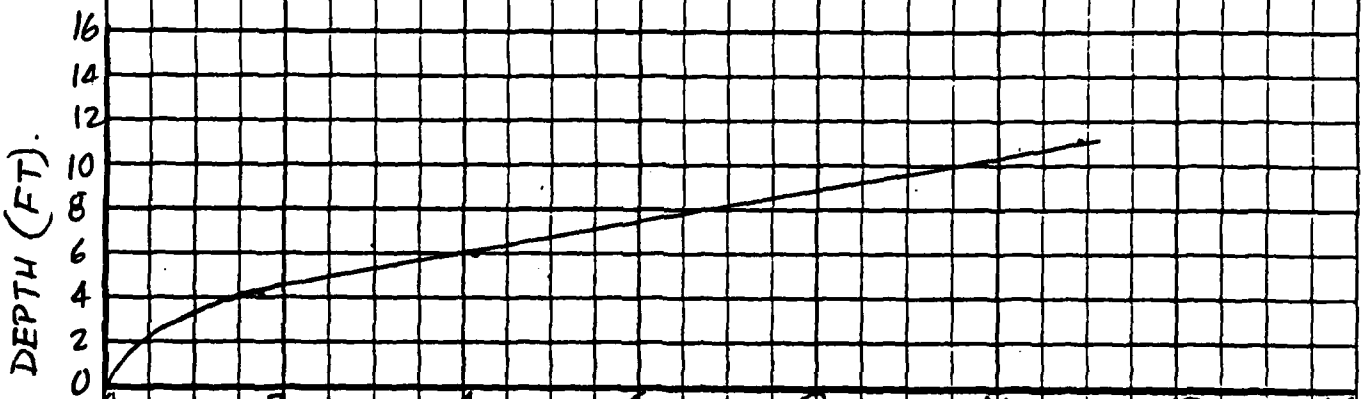
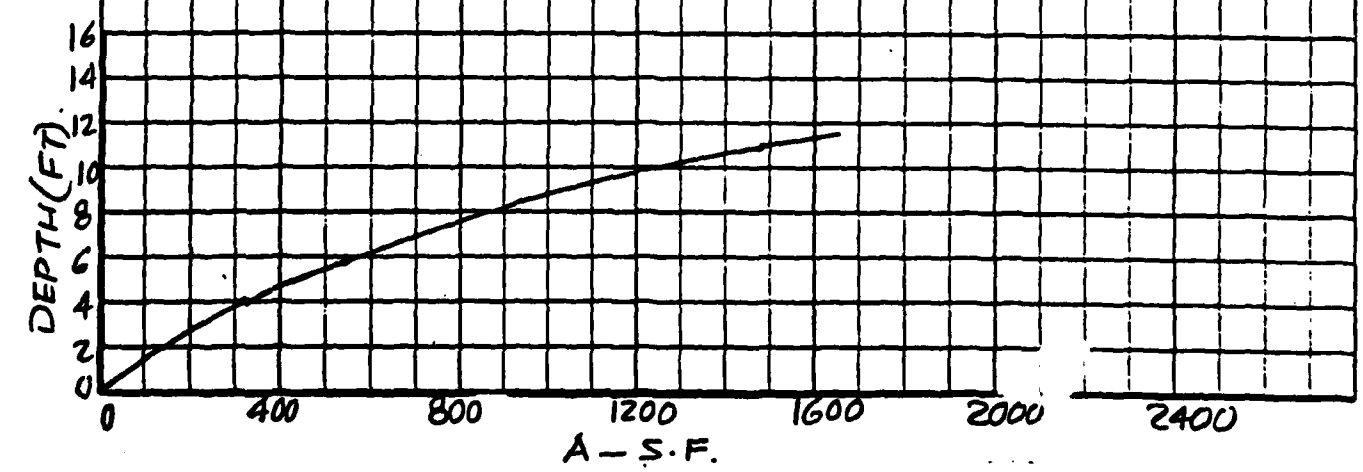
DOWNSTREAM FLOOD HAZARD

X-SECTION #3 STA. 50+0

$V = \frac{1.486}{n} R^{\frac{2}{3}} S^{\frac{1}{2}}$

ELEV (FT.)	D (FT.)	P_W (FT.)	A (S.F.)	$R = A/P_W$ (FT.)	S (FT/FT)	V (FT/SEC.)	Q (CFS.)
63.0	4.0	110	320	2.91	0.004	5.48	1750
65.0	6.0	120	550	4.58		7.42	4080
70.0	11.0	330	1490	4.52		7.35	10950





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Sheet Number
Date 3.30.1981
By H.S.

DOWNSTREAM FLOOD HAZARD

(UNDER TEST FLOOD 9,400 CFS WHICH EXCEEDS DAM FAILURE FLOW OF 5,400

X-SECTION #1 STA 510

FOR Q_{P_1} = 9400 CFS,

H_1 = 9.0′ AND A_1 = 1240 S.F.

REACH LENGTH = 500′

STORAGE = 500 × 1240 / 43560 = 14 AC.FT.

$Q_{P_2} = Q_{P_1}\left(1 - \frac{14}{150}\right)$ = 9400 × 0.91 = 8,550 CFS.

H_2 = 8.9′ AND A_2 = 1130 SF.

STORAGE = 500 × 1130 / 43560 = 13 AC.FT.

AVG STORAGE = ½ (13+14) = 13.5 AC.FT

$Q_{P_3} = Q_{P_1}\left(1 - \frac{13.5}{150}\right)$ = 9400 × 0.91 = 8,550 CFS.

THE ROUTED FLOW BELOW X-SECTION #1 WILL BE APPROX. 8,550 CFS.

AND DEPTH OF FLOW = 8.9′

FLOOD ELEVATION = 81.4 + 8.9′

= 90.3

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Job SCHWARTZ POND D...
Sheet Number
Date 3.30.1981
By R.S.

DOWNSTREAM FLOOD HAZARD

X- SECTION #2 STA. 27+0

FOR Q_{p_1} = 8550 CFS

H_1 = 6.1' AND A_1 = 1220 SF.

REACH LENGTH = 2200'

STORAGE = 2200 × 1220 / 43560

= 62 AC.FT.

$Q_{p_2} = Q_{p_1}(1 - \frac{62}{150})$ = 8550 × 0.59 = 5050 CFS

H_2 = 4.9' A_2 = 806 S.F.

STORAGE = 806 × 2200 / 43560 = 41 AC.FT.

AVG. STORAGE = ½ (41 + 62) = 52 AC.FT.

$Q_{p_3} = Q_{p_1}(1 - \frac{52}{150})$ = 8550 × 0.65 = 5600 CFS

H_3 = 5.0'

ROUTED FLOW BELOW X-SEC. #2 WILL BE APPROXIMATELY 5600 CFS

FLOOD ELEVATION = 71.5 + 5.0

= 76.5

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Job SCHWARTZ POND DAM
Sheet Number
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DOWNSTREAM FLOOD HAZARD
X-SECTION #3 STA. 50+0

FOR $Q_{P_1} = 5{,}600$

$H_1 = 7.1$ AND $A_1 = 757$ S.F.

REACH LENGTH = 2300 FT.

STORAGE = $2300 \times 757 / 43560 = 40$ AC FT.

$Q_{P_2} = Q_{P_1}\left(1 - \frac{40}{150}\right) = 5600 \times 0.73 = 4100$ CFS

$H_2 = 6.0'$ AND $A_2 = 550$

STORAGE = $550 \times 2300 / 43560 = 29$ AC.FT.

AVG. STORAGE = $\frac{1}{2}(29 + 40) = 34.5$ AC.FT.

$Q_{P_3} = Q_{P_1}\left(1 - \frac{34.5}{150}\right) = 5600 \times 0.77 = 4{,}300$ CFS.

AND $H_3 = 6.2'$

ROUTED FLOW BELOW X-SEC. #3 WILL BE 4,300 CFS. APPROXIMATELY

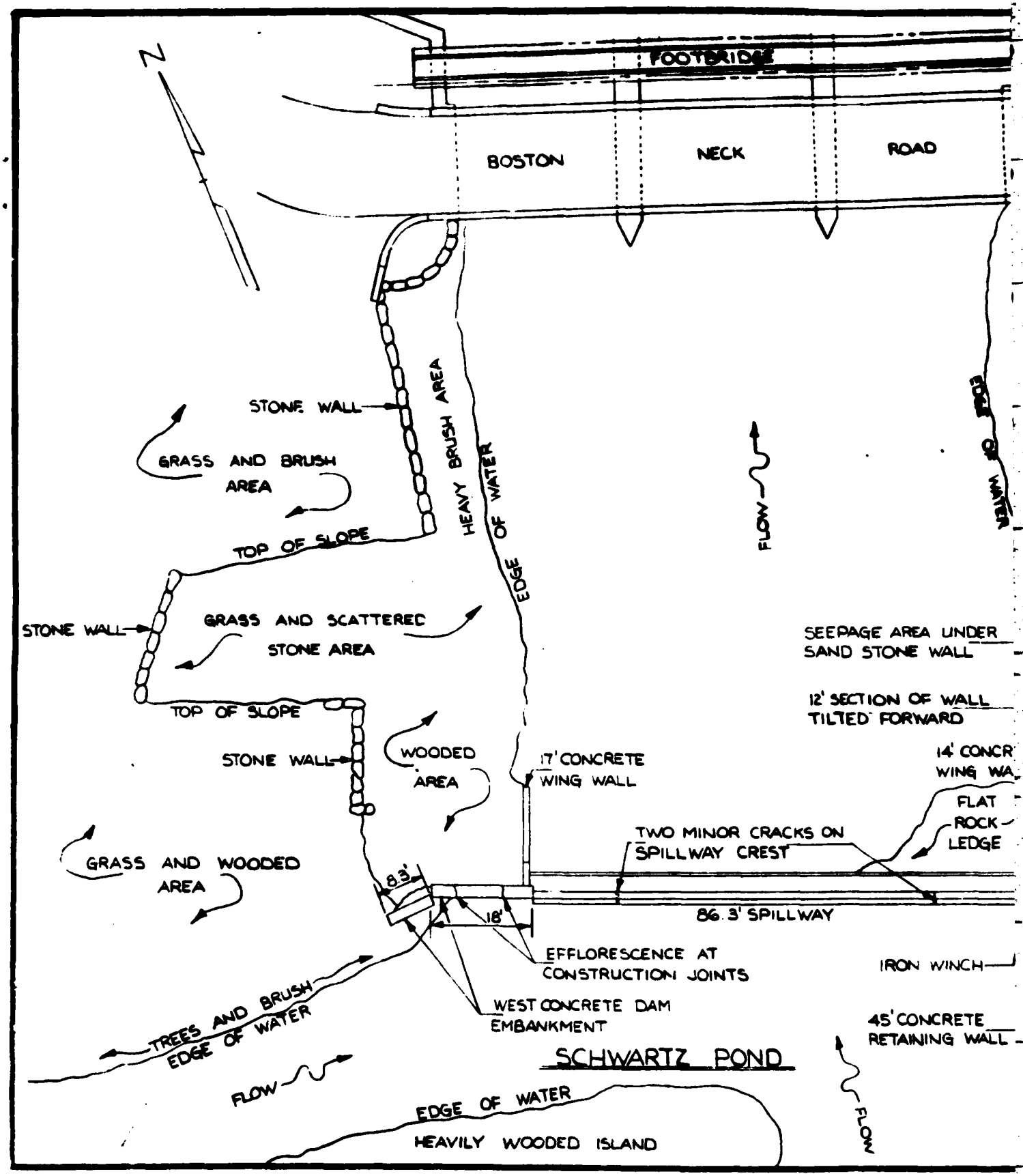
FLOOD FLOW ELEVATION

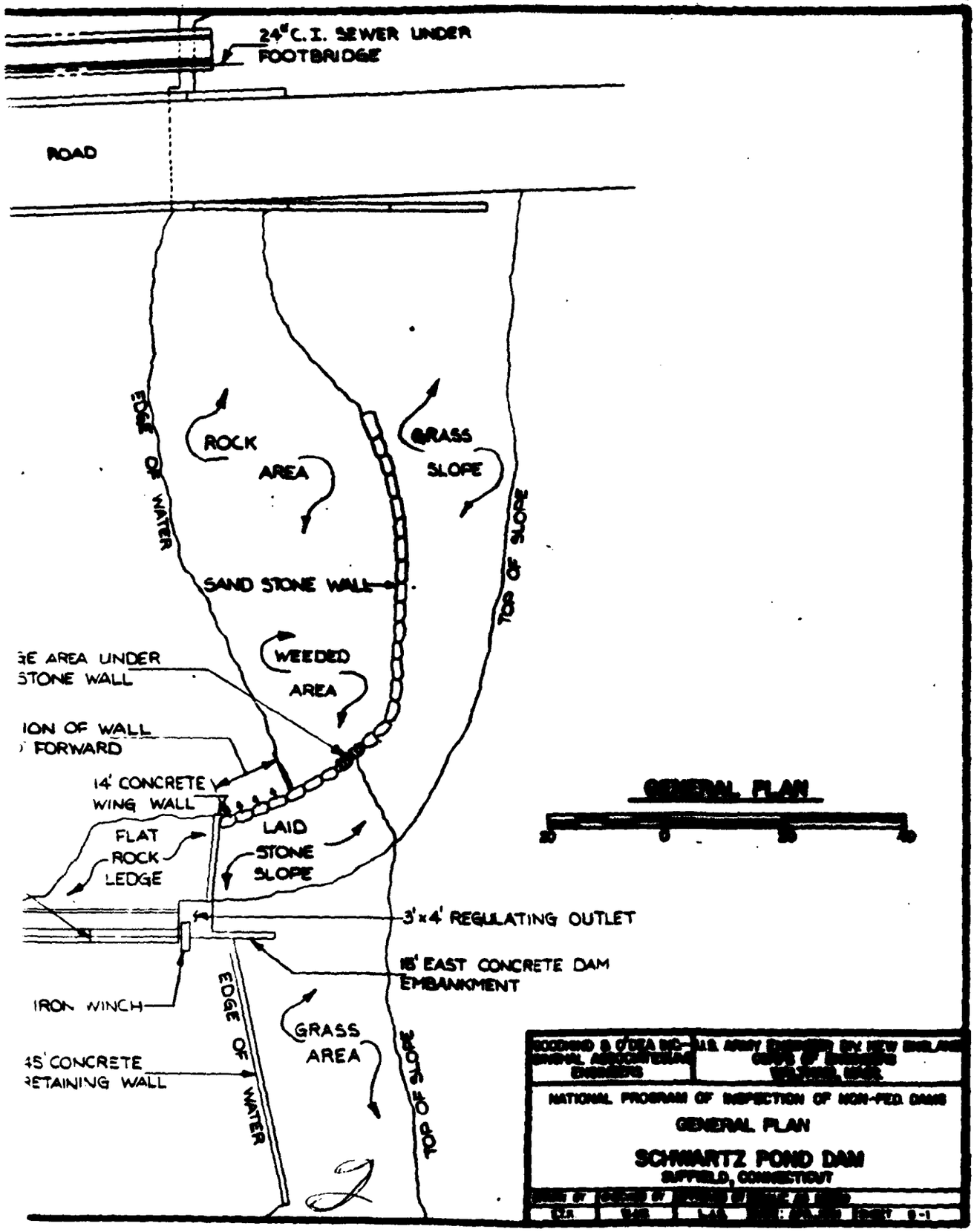
$= 59.0 + 6.2 = 65.2$

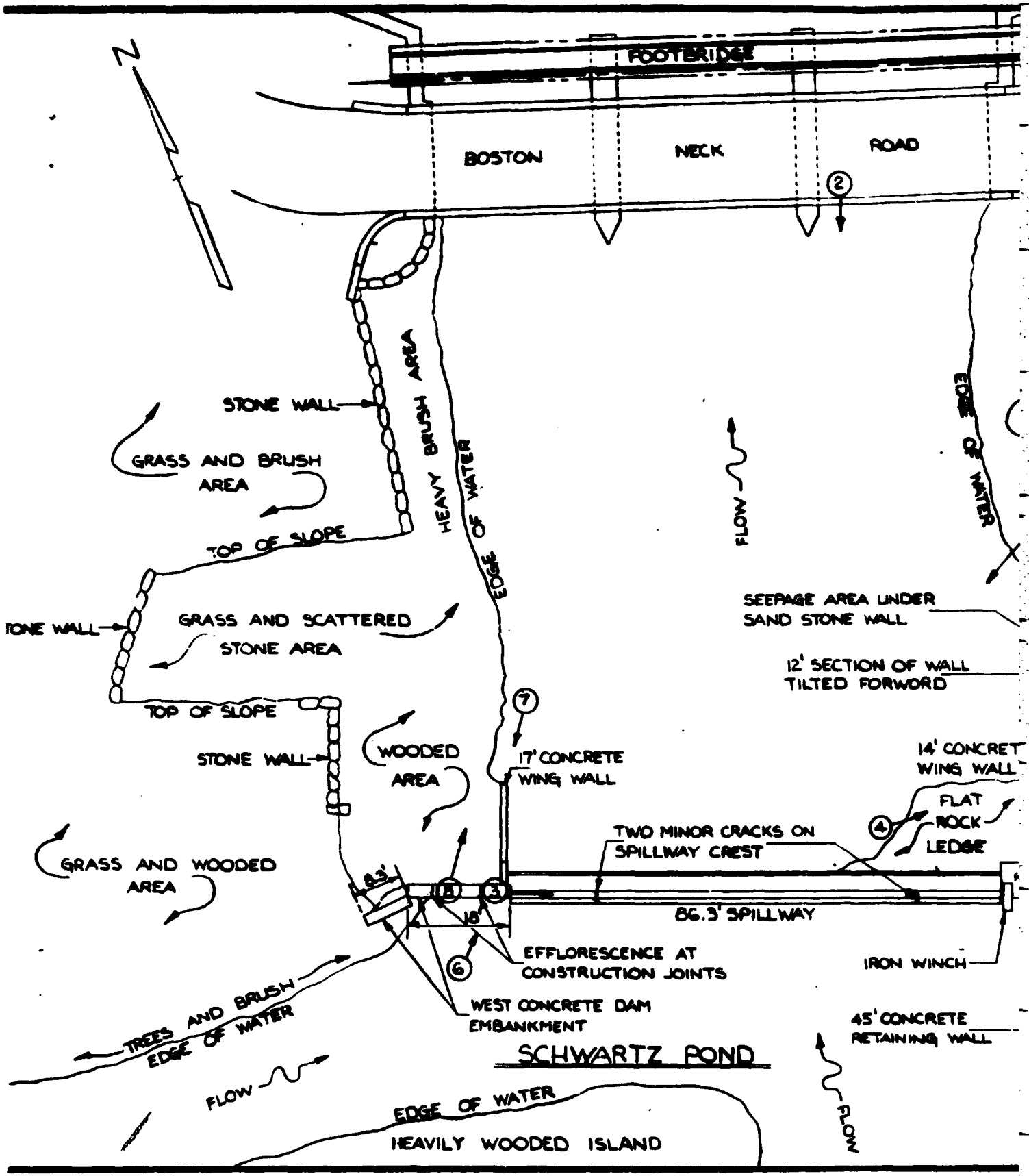
SAY 65.0

NOTE: THERE IS NO FLOODING HAZARD UNDER TEST FLOOD CONDITIONS EXCEPT PARTIAL FLOODING OF ONE HOUSE.

THE DAM BREACH FLOOD FLOW BEING SMALLER THAN TEST FLOOD WILL NOT PRODUCE ADDITIONAL HAZARD


N
FOOTBRIDGE
BOSTON
NECK
ROAD
STONE WALL
GRASS AND BRUSH AREA
TOP OF SLOPE
HEAVY BRUSH AREA
EDGE OF WATER
FLOW
EDGE OF WATER
STONE WALL
GRASS AND SCATTERED STONE AREA
SEEPAGE AREA UNDER SAND STONE WALL
12' SECTION OF WALL TILTED FORWARD
TOP OF SLOPE
STONE WALL
WOODED AREA
17' CONCRETE WING WALL
14' CONCR WING WA
FLAT ROCK LEDGE
TWO MINOR CRACKS ON SPILLWAY CREST
GRASS AND WOODED AREA
8.3'
18'
86.3' SPILLWAY
EFFLORESCENCE AT CONSTRUCTION JOINTS
IRON WINCH
WEST CONCRETE DAM EMBANKMENT
45' CONCRETE RETAINING WALL
TREES AND BRUSH EDGE OF WATER
SCHWARTZ POND
FLOW
EDGE OF WATER
HEAVILY WOODED ISLAND
FLOW


24" C.I. SEWER UNDER FOOTBRIDGE
ROAD
EDGE OF WATER
ROCK AREA
GRASS SLOPE
TOP OF SLOPE
SAND STONE WALL
WEEDED AREA
GE AREA UNDER STONE WALL
ION OF WALL FORWARD
14' CONCRETE WING WALL
FLAT ROCK LEDGE
LAID STONE SLOPE
3'x4' REGULATING OUTLET
15' EAST CONCRETE DAM EMBANKMENT
IRON WINCH
EDGE OF WATER
GRASS AREA
45' CONCRETE RETAINING WALL
TOP OF SLOPE
GENERAL PLAN
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS
GENERAL PLAN
SCHWARTZ POND DAM
SUFFIELD, CONNECTICUT


N
FOOTBRIDGE
BOSTON
NECK
ROAD
2
STONE WALL
GRASS AND BRUSH AREA
TOP OF SLOPE
HEAVY BRUSH AREA
EDGE OF WATER
FLOW
EDGE OF WATER
SEEPAGE AREA UNDER SAND STONE WALL
12' SECTION OF WALL TILTED FORWORD
STONE WALL
GRASS AND SCATTERED STONE AREA
TOP OF SLOPE
STONE WALL
WOODED AREA
7
17' CONCRETE WING WALL
14' CONCRET WING WALL
FLAT ROCK LEDGE
4
TWO MINOR CRACKS ON SPILLWAY CREST
GRASS AND WOODED AREA
8.3'
1
3
18'
86.3' SPILLWAY
6
EFFLORESCENCE AT CONSTRUCTION JOINTS
IRON WINCH
TREES AND BRUSH
EDGE OF WATER
WEST CONCRETE DAM EMBANKMENT
45' CONCRETE RETAINING WALL
SCHWARTZ POND
FLOW
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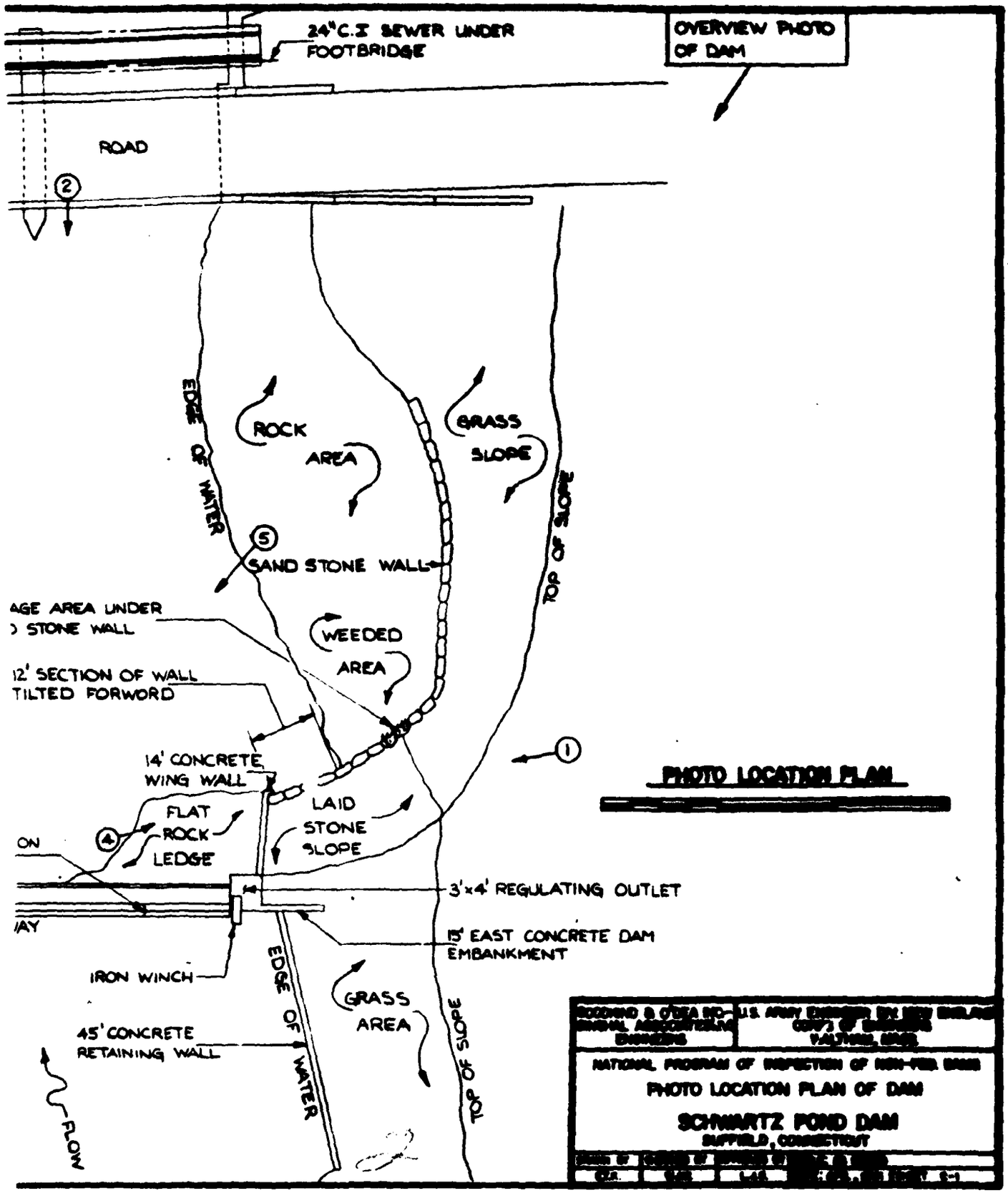
FLOW


24"C.I SEWER UNDER FOOTBRIDGE
OVERVIEW PHOTO OF DAM
ROAD
2
EDGE OF WATER
ROCK AREA
GRASS SLOPE
TOP OF SLOPE
5
SAND STONE WALL
AGE AREA UNDER
STONE WALL
WEEDED AREA
12' SECTION OF WALL TILTED FORWORD
14' CONCRETE WING WALL
1
PHOTO LOCATION PLAN
FLAT ROCK LEDGE
4
LAID STONE SLOPE
ON
3'x4' REGULATING OUTLET
AY
15' EAST CONCRETE DAM EMBANKMENT
IRON WINCH
EDGE OF WATER
GRASS AREA
45' CONCRETE RETAINING WALL
TOP OF SLOPE
FLOW
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS
PHOTO LOCATION PLAN OF DAM
SCHWARTZ POND DAM
SUFFIELD, CONNECTICUT

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

END

FILMED

9-84

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